January 30, 2004
Supersedes October 15, 2003

BEFORE SUBMITTING YOUR BID

1. **Use pen and ink to complete the Bid.**

2. **Have you signed and completed the Contract Agreement, Offer & Award Forms?**

3. **As a minimum, the Bidder will submit a Bid Package consisting of the Notice to Contractors, the completed Acknowledgement of Bid Amendments & Submission of Bid Bond Validation Number form, the completed Schedule of Items, 2 copies of the completed Agreement, Offer, & Award form, a Bid Bond or Bid Guarantee, and any other Certifications or Bid Requirements listed in the Bid Book.**

4. **Have you included prices for all Bid Items? ("Zero is not considered a bid price.")**

5. **Have you included a bid guarantee? Acceptable forms are:**

   A. **Bid Bond on the Department's prescribed form for 5% of the Bid Amount. (Or forms that do not contain any significant variations from the Department's forms as solely determined by the Department.)**

   B. **Official Bank Check, Cashier's Check, Certified Check, U.S. Postal Money Order or Negotiable Certificate of Deposit in the amount stated in the Notice to Contractors.**

6. **If the written Bid is to be sent, Federal Express overnight delivery is suggested as the package is delivered directly to the DOT Headquarters Building in Augusta. Other means, such as U.S. Postal Services' Express Mail has proven not to be reliable.**

AND FOR FEDERAL AID PROJECTS

7. **Have you included your DBE Utilization commitment in the proper amounts and signed the DBE Certification?**

If you need further information regarding Bid preparation, call the DOT Contracts Section at (207)624-3410.

For complete specifications regarding bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, Revision December 2002.

January 30, 2004
Supercedes February 11, 2003

NOTICE

The Maine Department of Transportation is attempting to improve the way Bid Amendments/Addendums are handled, and allow for an electronic downloading of bid packages from our website, while continuing to maintain a planholders list.

Prospective bidders, subcontractors or suppliers who wish to download a copy of the bid package and receive a courtesy notification of project specific bid amendments, must provide an email address to Diane Barnes at the MDOT Contracts mailbox at: MDOT.contracts@maine.gov. Each bid package will require a separate request.

Additionally, interested parties will be responsible for reviewing and retrieving the Bid Amendments from our web site, and acknowledging receipt and incorporating those Bid Amendments in their bids using the Acknowledgement of Bid Amendment Form.

The downloading of bid packages from the MDOT website is not the same as providing an electronic bid to the Department. Electronic bids must be submitted via **http://www.BIDX.com**. For information on electronic bidding contract Rebecca Pooler at **rebecca.pooler@maine.gov**.

NOTICE

For security and other reasons, all Bid Packages which are mailed, shall be provided in double (one envelope inside the other) envelopes. The *Inner Envelope* shall have the following information provided on it:

Bid Enclosed - Do Not Open
PIN:
Town:
Date of Bid Opening:
Name of Contractor with mailing address and telephone number:

In Addition to the usual address information, the *Outer Envelope* should have written or typed on it:

Double Envelope: Bid Enclosed
PIN:
Town:
Date of Bid Opening:
Name of Contractor:
This should not be much of a change for those of you who use Federal Express or similar services.

Hand-carried Bids may be in one envelope as before, and should be marked with the following infrormation:

Bid Enclosed: Do Not Open
PIN:
Town:
Name of Contractor:

STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Bid Guaranty-Bid Bond Form

KNOW ALL MEN BY THESE PRESENTS THAT_____

_____, of the City/Town of _____and State of_____

as Principal, and _____as Surety, a

Corporation duly organized under the laws of the State of_____and having a usual place of

Business in _____and hereby held and firmly bound unto the Treasurer of

the State of Maine in the sum of_____,for payment which Principal and Surety bind

themselves, their heirs, executers, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a part herein, to enter into a written contract for the construction of _____

_____

_____and if the Department shall accept said bid and the Principal shall execute and deliver a contract in the form attached hereto (properly completed in accordance with said bid) and shall furnish bonds for this faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full force, and effect.

Signed and sealed this_____day of _____20_____

WITNESS:

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

WITNESS

_____

_____

_____

SURETY:

By_____

By:_____

Name of Local Agency: _____

NOTICE

Bidders:

Please use the attached “Request for Information” form when faxing questions and comments concerning specific Contracts that have been Advertised for Bid. Include additional numbered pages as required.

State of Maine
Department of Transportation

REQUEST FOR INFORMATION

Date _____ Time _____

Information Requested: **PIN: _____ Town(s): _____**

Request by: _____ Phone: (_____)_____
Bid Date: _____ Fax: (_____)_____

Complete top portion of form and transmit to the number listed in the Notice to Contractors

RFI No: _____ RFI received: _____

Response:_____

Response By:_____ Date: _____

INSTRUCTIONS FOR PREPARING THE CONTRACTOR'S DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION PLAN

The Contractor Shall:

1. Submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan to the Contract's Engineer by 4:30 P.M. on the Bid day.

2. Extend equal opportunity to MDOT certified DBE firms (as listed in MDOT's DBE Directory of Certified Businesses) in the selection and utilization of Subcontractors and Suppliers.

SPECIFIC INSTRUCTIONS FOR COMPLETING THE FORM:

Insert Contractor name, the name of the person(s) preparing the form, and that person(s) telephone and fax number.

Provide total Bid price, Federal Project Identification Number, and location of the Project work.

In the columns, name each DBE firm to be used, provide the Unit or Item cost of the Work/Product to be provided by the DBE firm, give a brief description of the Work, and the dollar value of the Work.

If no DBE firm is to be utilized, the Contractor must document the reason(s) why no DBE firms are being used. Specific supporting evidence of good faith efforts taken by Contractors to solicit DBE Bidders must be attached. This evidence, as a minimum, includes phone logs, e-mail and/or mail DBE solicitation records, and the documented results of these solicitations.

NOTICE

Disadvantaged Business Enterprise Proposed Utilization

The Apparent Low Bidder must submit the Disadvantaged Business Enterprise Proposed Utilization form by close of Business (4:30 P.M.) on Bid day.

The Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan form contains additional information that is required by USDOT.

The Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan form must be used.

A copy of the new Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan and instructions for completing it are attached.

Note: Questions about DBE firms, or to obtain a printed copy of the DBE Directory, contact Equal Opportunity at (207) 624-3066.

MDOTs DBE Directory of Certified firms can also be obtained at http://www.state.me.us/mdot/humnres/o_equalo/cdwbed_h.htm

CONTRACTOR'S DISADVANTAGED BUSINESS ENTERPRISE PROPOSED UTILIZATION PLAN

Low Bidder shall furnish completed form to Contracts Section by 4:30 P.M. on Bid Opening day.

TO: MDOT Contracts Section
16 State House Station,
Augusta, Me 04333-0016
or
Fax: 207-624-3431

Contractor: _____
Prepared by: _____

Telephone: _____ Fax: _____

BID PRICE: $_____FEDERAL PROJECT #_____LOCATION: _____

TOTAL DBE PARTICIPATION AS A PERCENT OF TOTAL BID PRICE = _____%

DBE Firm*	Unit/Item Cost	Unit #	Description of work & Item Number	Actual $ Value
			Total >	

If no DBE firm(s) are used, bidder must document efforts made to secure DBE participation and attach supporting evidence of this effort:

_____

_____.

Examples: Bidder relies wholly upon low quote subcontractor section, DBE firm(s) were not low quote. No DBE firms bid.

***Only DBE firms certified by MDOT prior to bidding can be utilized by Contractor for DBE credit. Directory of certified DBEs is available on MDOT's website: www.state.me.us/mdot**

Equal Opportunity Use:

Plan received ___/___/___ Verified by: _____ Action: _____

Office of Human Resources

Equal Opportunity

MAINE DEPARTMENT OF TRANSPORTATION

Certified Disadvantaged and Women Business Enterprise

DBE DIRECTORY - MINORITY OWNED

WBE DIRECTORY - WOMEN OWNED

WEBSITE FOR DIRECTORY CAN BE FOUND AT:
http://www.state.me.us/mdot/humnres/o_equalo/cdwbed_h.htm

It is the responsibility of the Contractor to access the DBE Directory at this site in order to have the most current listings.

STATE OF MAINE DEPARTMENT OF TRANSPORTATION
NOTICE TO CONTRACTORS

Sealed Bids addressed to the Maine Department of Transportation, Augusta, Maine 04333 and endorsed on the wrapper "Bids for Highway Reconstruction in the city of **Ellsworth**" will be received from contractors at the Reception Desk, Maine DOT Building, Child Street, Augusta, Maine, until 11:00 o'clock A.M. (prevailing time) on November 17, 2004 , and at that time and place publicly opened and read. Bids will be accepted from contractors prequalified by the Department of Transportation for Highway Construction projects. All other Bids may be rejected. **MDOT provides the option of electronic bidding. We now accept electronic bids for those bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. Please note: the Department will accept a facsimile of the bid bond; however, the original bid bond must then be received at the MDOT Contract Section within 72 hours of the bid opening. During this transition, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.**

Description: Maine Federal Aid Project No. NH-7106(00)E, PIN. 7106.00

Location: In Hancock County, project is located Oak and Church St's extending easterly 1.02 km along Oak and High St's to Washington St. intersection.

Outline of Work: Grading, drainage, base, hot mix asphalt, curb, traffic signals, water main utilities, landscaping, lighting, and other incidental work.

The basis of award will be Section 0001.

For general information regarding Bidding and Contracting procedures, contact Scott Bickford at (207)624-3410. Our webpage at http://www.state.me.us/mdot/project/design/homepg.htm contains a copy of the schedule of items, Plan Holders List, written portions of bid amendments (not drawings), and bid results. For Project-specific information fax all questions to **Project Manager** Todd Pelletier at (207)624-3431. Questions received after 12:00 noon of Monday prior to bid date will not be answered. Bidders shall not contact any other Departmental staff for clarification of Contract provisions, and the Department will not be responsible for any interpretations so obtained. Hearing impaired persons may call the Telecommunication Device for the Deaf at (207) 624-3007.

Plans, specifications and bid forms may be seen at the Maine DOT Building in Augusta, Maine and at the Department of Transportation's Region 4 Office in Ellsworth. They may be purchased from the Department between the hours of 8:00 a.m. to 4:30 p.m. by cash, credit card (Visa/Mastercard) or check payable to Treasurer, State of Maine sent to Maine Department of Transportation, Attn.: Mailroom, 16 State House Station, Augusta, Maine 04333-0016. They also may be purchased by telephone at (207)624-3536 between the hours of 8:00 a.m. to 4:30 p.m. Full size plans $105.00 ($112.00 by mail). Half size plans $53.00 ($57.00 by mail), Bid Book $10 ($13 by mail), Single Sheets $2, payment in advance, all non-refundable.

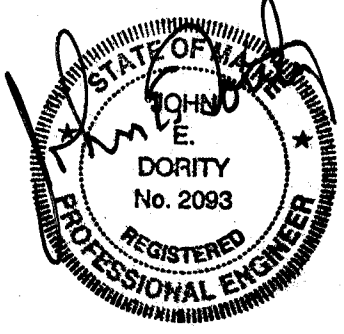
Each Bid must be made upon blank forms provided by the Department and must be accompanied by a bid bond at 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of $60,000.00 payable to Treasurer, State of Maine as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each in the amount of 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable Federal Laws. This contract is subject to compliance with the Disadvantaged Business Enterprise program requirements as set forth by the Maine Department of Transportation.

All work shall be governed by "State of Maine, Department of Transportation, Standard Specifications, Revision of December 2002", price $10 [$13 by mail], and Standard Details, Revision of December 2002, price $20 [$25 by mail] Standard Detail updates can be found at http://www.state.me.us/mdot/project/design/homepg.htm

The right is hereby reserved to the MDOT to reject any or all Bids.

Augusta, Maine
October 27, 2004



JOHN E. DORITY
CHIEF ENGINEER

January 26, 1999

SPECIAL PROVISION
PARTNERING

The successful bidder will have the opportunity to enter into a cooperative partnership agreement with the State Department of Transportation for the contract. The objective of this agreement is the effective completion of the work on time and to the standard of quality that will be a source of pride to both the State and the Contractor. The partnering agreement will not affect the terms of the contract. It is intended only to establish an environment of cooperation between the parties. If the partnering agreement is accepted.

1. Contractor shall select and provide a third-party facilitator to conduct the team building workshop for the Contractor and Department personnel. Facilitator selection shall require Department concurrence. The cost for the facilitator and his associated expenses will be shared equally by the Department on the next monthly estimate, following receipt of invoice(s) from the Contractor, on an extra work basis.

2. Contractor and Department will exchange lists of the key personnel to be participants in the workshop. The list will contain the name and job title of each person, a contact phone number, and the address for job related correspondence.

3. The Contractor shall select the location and make all arrangements for space as required by facilitator, and for any meals required. This cost to be shared equally.

4. A working arrangement for the partnership will be agreed upon in writing at the workshop. The arrangement will set out the mutually recognized goals and expectation of the parties.

5. The Contractor and the Department agree to make an effort to maintain identified key personnel assigned to the work for its duration. A timely notice by each shall be given if changes by either must be made.

6. Project issues shall be processed in the manner agreed upon by the parties during the orientation.

7. Follow-up workshops may be held periodically throughout the duration of the contract as agreed by the Contractor and the Department.

8. The Partnering Agreement is not intended to be a legal document. Failure by either party to follow the process identified will not be grounds for any claim under the contract.

9. ARE YOU INTERESTED IN THIS OPPORTUNITY? YES _____ NO _____

Ellsworth
7106.00
August 3, 2004
Supercedes March 17, 2004

SPECIAL PROVISION 102.7.3
ACKNOWLEDGMENT OF BID AMENDMENTS

With this form, the Bidder acknowledges its responsibility to check for all Amendments to the Bid Package. For each Project under Advertisement, Amendments are located at http://www.maine.gov/mdot/comprehensive-list-projects/project-information.php It is the responsibility of the Bidder to determine if there are Amendments to the Project, to download them, to incorporate them into their Bid Package, and to reference the Amendment number and the date on the form below. The Maine DOT will not post Bid Amendments any later than noon the day before Bid opening without individually notifying all the planholders.

Amendment Number	Date

The Contractor, for itself, its successors and assigns, hereby acknowledges that it has received all of the above referenced Amendments to the Bid Package.

CONTRACTOR

_____ _____
Date Signature of authorized representative

_____
(Name and Title Printed)

MAINE DEPARTMENT OF TRANSPORTATION

BID

DATE OF OPENING : **CALL ORDER :**

CONTRACT ID : 007106.00

PROJECTS

NH-7106(00)E

COUNTY : HANCOCK

SCHEDULE OF ITEMS REVISED:

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
		SECTION 0001 HIGHWAY ITEMS				
0010	107.51 PROSECUTION OF WORK - INITIAL SCHEDULE	LUMP	LUMP			
0020	107.53 PROSECUTION OF WORK - BIWEEKLY UPDATES	12.000 EA				
0030	201.23 REMOVING SINGLE TREE TOP ONLY	4.000 EA				
0040	201.24 REMOVING STUMP	5.000 EA				
0050	202.15 REMOVING MANHOLE OR CATCH BASIN	11.000 EA				
0060	203.20 COMMON EXCAVATION	15280.000 M3				
0070	203.2312 HEALTH AND SAFETY PLAN	LUMP	LUMP			
0080	203.2333 DISPOSAL OF SPECIAL EXCAVATION	15.000 MG				
0090	203.25 GRANULAR BORROW	30.000 M3				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0100	206.061 STRUCTURAL EARTH EXCAVATION - DRAINAGE AND MINOR STRUCTURES, BELOW GRADE	50.000 M3				
0110	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	10145.000 M3				
0120	403.207 HOT MIX ASPHALT 19.0 MM NOMINAL MAX SIZE	4850.000 MG				
0130	403.208 HOT MIX ASPHALT 12.5 MM, SURFACE	1800.000 MG				
0140	403.209 HOT MIX ASPHALT 9.5 MM(SIDEWALKS,DRIVES, INCIDENTAL)	1040.000 MG				
0150	403.213 HOT MIX ASPHALT 12.5 MM, BASE	1800.000 MG				
0160	409.15 BITUMINOUS TACK COAT APPLIED	1550.000 L				
0170	502.341 STRUCTURAL CONCRETE ROADWAY MEDIAN	27.000 M3				
0180	603.159 300 MM CULVERT PIPE OPTION III	17.000 M				
0190	603.169 375 MM CULVERT PIPE OPTION III	4.800 M				
0200	603.195 600 MM RCP CLASS III	18.000 M				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0210	603.199 600 MM CULVERT PIPE OPTION III	20.400 M				
0220	604.072 CATCH BASIN TYPE A1-C	5.000 EA				
0230	604.076 1500 MM CATCH BASIN TYPE A1-C	1.000 EA				
0240	604.092 CATCH BASIN TYPE B1-C	1.000 EA				
0250	604.15 MANHOLE	2.000 EA				
0260	604.16 ALTERING CATCH BASIN TO MANHOLES	15.000 EA				
0270	604.167 ALTER CATCH BASIN GRATE TO CASCADE	1.000 EA				
0280	604.18 ADJUSTING MANHOLE OR CATCH BASIN TO GRADE	8.000 EA				
0290	604.182 CLEAN EXISTING CATCH BASIN AND MANHOLE	2.000 EA				
0300	604.2404 SUB-BASIN BOWL	13.000 EA				
0310	604.247 CATCH BASIN TYPE F5-C	1.000 EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0320	604.252 CATCH BASIN TYPE A5-C	5.000 EA				
0330	604.257 1800 MM CATCH BASIN TYPE A5-C	2.000 EA				
0340	605.09 150 MM UNDERDRAIN TYPE B	310.000 M				
0350	605.15 600 MM UNDERDRAIN TYPE C	42.000 M				
0360	607.24 REMOVE AND RESET FENCE	20.000 M				
0370	608.253 MASONRY PAVER WITH TRUNCATED DOME	35.000 M2				
0380	609.11 VERTICAL CURB TYPE 1	1620.000 M				
0390	609.12 VERTICAL CURB TYPE 1 - CIRCULAR	160.000 M				
0400	609.237 TERMINAL CURB TYPE 1 - 2.1 METER	230.000 EA				
0410	609.31 CURB TYPE 3	327.000 M				
0420	610.08 PLAIN RIPRAP	5.000 M3				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0430	613.319 EROSION CONTROL BLANKET	30.000	M2				
0440	615.07 LOAM	371.000	M3				
0450	618.1301 SEEDING METHOD NUMBER 1 - PLAN QUANTITY	34.000	UN				
0460	618.1411 SEEDING METHOD NUMBER 3 - PLAN QUANTITY	3.000	UN				
0470	618.15 TEMPORARY SEEDING	11.000	KG				
0480	619.1201 MULCH - PLAN QUANTITY	2.000	UN				
0490	620.56 DRAINAGE GEOTEXTILE	510.000	M2				
0500	621.202 MEDIUM DECIDUOUS TREE (50 MM - 65 MM CALIPER) GROUP B	3.000	EA				
0510	621.273 LARGE DECIDUOUS TREE (50 MM - 65 MM CALIPER) GROUP A	12.000	EA				
0520	621.54 DECIDUOUS SHRUBS (450 MM - 600 MM) GROUP A	36.000	EA				
0530	621.71 HERBACEOUS PERENNIALS GROUP A	120.000	EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0540	621.80 ESTABLISHMENT PERIOD	LUMP	LUMP			
0550	626.22 NON-METALLIC CONDUIT	100.000 M				
0560	626.31 450 MM FOUNDATION	2.000 EA				
0570	626.331 900 MM FOUNDATION	5.000 EA				
0580	626.35 CONTROLLER CABINET FOUNDATION	1.000 EA				
0590	626.36 REMOVE OR MODIFY CONCRETE FOUNDATION	4.000 EA				
0600	627.711 WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE (PLAN QUANTITY)	3505.000 M				
0610	627.75 WHITE OR YELLOW PAVEMENT AND CURB MARKING	230.000 M2				
0620	627.76 TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW	LUMP	LUMP			
0630	629.05 HAND LABOR, STRAIGHT TIME	30.000 HR				
0640	631.10 AIR COMPRESSOR (INCLUDING OPERATOR)	5.000 HR				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0650	631.11 AIR TOOL (INCLUDING OPERATOR)	5.000 HR				
0660	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	10.000 HR				
0670	631.13 BULLDOZER (INCLUDING OPERATOR)	10.000 HR				
0680	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	20.000 HR				
0690	631.20 STUMP CHIPPER (INCLUDING OPERATOR)	5.000 HR				
0700	631.22 FRONT END LOADER (INCLUDING OPERATOR)	10.000 HR				
0710	631.32 CULVERT CLEANER (INCLUDING OPERATOR)	10.000 HR				
0720	634.208 REMOVE AND RESET LIGHT STANDARDS	1.000 EA				
0730	636.64 SEGMENTAL RETAINING WALL - 4' OR GREATER	330.000 M2				
0740	637.071 DUST CONTROL	LUMP	LUMP			
0750	639.18 FIELD OFFICE TYPE A	1.000 EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0760	643.71 TRAFFIC SIGNAL MODIFICATION	LUMP	LUMP			
0770	643.91 MAST ARM POLE W/12 m MAST ARM	1.000 EA				
0780	643.91 MAST ARM POLE W/14 m MAST ARM	2.000 EA				
0790	643.91 MAST ARM POLE W/9 m MAST ARM	1.000 EA				
0800	643.92 PEDESTAL POLE	1.000 EA				
0810	652.311 TYPE II BARRICADE	10.000 EA				
0820	652.33 DRUM	90.000 EA				
0830	652.34 CONE	90.000 EA				
0840	652.35 CONSTRUCTION SIGNS	102.000 M2				
0850	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP	LUMP			
0860	652.38 FLAGGER	5040.000 HR				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0870	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP	LUMP			
0880	657.24 SEEDING PITS	53.000 UN				
0890	658.20 ACRYLIC LATEX COLOR FINISH, GREEN	10.000 M2				
0900	659.10 MOBILIZATION	LUMP	LUMP			
0910	660.21 ON-THE-JOB TRAINING (BID)	2000.000 HR				
0920	812.162 ADJUST SEWER MANHOLE TO GRADE	14.000 EA				
0930	812.164 REBUILDING SEWER MANHOLE	2.000 EA				
0940	822.33 150 MM CLASS 52 DI PIPE	135.000 M				
0950	822.34 200 MM CLASS 52 DI PIPE	160.000 M				
0960	823.325 200 MM GATE VALVE	2.000 EA				
0970	823.3256 LIVE TAP CONNECTIONS (300 MM X 150 MM)	4.000 EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0980	823.3256 LIVE TAP CONNECTIONS (300 MM X 200 MM)	1.000 EA				
0990	823.331 150 MM GATE VALVE	7.000 EA				
1000	823.332 GATE VALVE BOX, ADJUST TO GRADE	20.000 EA				
1010	824.30 FIRE HYDRANTS	7.000 EA				
1020	824.31 REMOVE FIRE HYDRANT	2.000 EA				
1030	825.41 19 MM COPPER SERVICE	375.000 M				
1040	825.43 25 MM COPPER SERVICE	50.000 M				
1050	825.431 38 MM COPPER SERVICE	20.000 M				
1060	827.301 ROCK EXCAVATION WATER MAIN	80.000 M3				
1070	827.311 UNSUITABLE SOIL EXCAVATION, REMOVE AND REFILL- BELOW GRADE	20.000 M3				
1080	827.33 TRENCH INSULATION	600.000 M				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1090	832.065 TEMPORARY PIPING	LUMP	LUMP			
1100	832.07 OWNERS TESTING ALLOWANCE	LUMP	LUMP			
	SECTION 0001 TOTAL					.

SECTION 0002 LIGHTING

1110	201.30 TREE GRATE - 'A'	45.000 EA				
1120	201.30 TREE GRATE - 'B'	27.000 EA				
1130	403.1021 TEXTURED ASPHALT PAVEMENT	389.000 M2				
1140	507.086 STEEL RAIL	38.000 EA				
1150	626.31 450 MM FOUNDATION - SITE LIGHT BASE	61.000 EA				
1160	634.195 40 MM SCHEDULE 80 PVC	2296.670 M				
1170	634.21 CONVENTIONAL LIGHT STANDARD - SITE LIGHT 'A'	12.000 EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1180	634.21 CONVENTIONAL LIGHT STANDARD - SITE LIGHT 'A' W/ FLAG MOUNT	25.000 EA				
1190	634.21 CONVENTIONAL LIGHT STANDARD - SITE LIGHT 'B'	14.000 EA				
1200	634.21 CONVENTIONAL LIGHT STANDARD - SITE LIGHT 'B' W/ FLAG MOUNT	10.000 EA				
1210	634.317 # 10 AWG WIRE (CU)	1476.760 M				
1220	634.318 # 4 AWG WIRE (CU)	3351.280 M				
1230	634.319 # 3 AWG WIRE (CU)	1947.670 M				
1240	634.32 TRENCHING FOR ELECTRICAL WORK	2258.570 M				
1250	841.48 BOLLARDS - 12 "	61.000 EA				
1260	841.48 BOLLARDS - 8 "	56.000 EA				
	SECTION 0002 TOTAL					.

SECTION 0003 LANDSCAPING

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1270	621.147 SM DECID TR (65MM - 75MM CAL) GP A	5.000 EA				
1280	621.279 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP A PATMORE	18.000 EA				
1290	621.279 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP A SHADEMASTER	10.000 EA				
1300	621.28 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP B IVORY SILK	8.000 EA				
1310	621.28 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP B RED BARRON	8.000 EA				
1320	621.28 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP B SPRING SNOW	19.000 EA				
1330	621.281 LARGE DECIDUOUS TREE (65 MM - 75 MM CALIPER) GROUP C PRINCETON SENTRY	17.000 EA				
1340	621.402 DWARF EVERGREENS (600 MM - 750 MM) GROUP B BAR HARBOR	17.000 EA				
1350	621.402 DWARF EVERGREENS (600 MM - 750 MM) GROUP B PFITZERIANA COMPACTA	78.000 EA				

CONTRACT ID: 007106.00 PROJECT(S): NH-7106(00)E

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1360	621.54 DECIDUOUS SHRUBS (450 MM - 600 MM) GROUP A ALBA	9.000 EA				
1370	621.54 DECIDUOUS SHRUBS (450 MM - 600 MM) GROUP A SEAFOAM WHITE	10.000 EA				
1380	621.54 DECIDUOUS SHRUBS (450 MM - 600 MM) GROUP A THE FAIRY	50.000 EA				
1390	621.71 HERBACEOUS PERENNIALS GROUP A HAPPY RETURNS	983.000 EA				
1400	621.80 ESTABLISHMENT PERIOD	LUMP	LUMP			
	SECTION 0003 TOTAL					
	TOTAL BID					

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No.**7106.00** for **Highway Rehabilitation** in the city of **Ellsworth**, County of **Hancock**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **June 16, 2006.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is

Section 0001 $_____

Section 0002 $_____

Section 0003 $_____

Performance Bond and Payment Bond each being 100% of the amount awarded under this Contract (see award amount in Section G below).

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the Standard Specifications Revision of December 2002 (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advetisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN. 7106.00 - Highway Rehabilitation - in the city of Ellsworth,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work on the date specified in the Engineer's "Notice to Commence Work" as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted for (see checked boxes):

Section 0001 ❑
Section 0002 ❑
Section 0003 ❑

Contract Amount: _____

This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: David A. Cole, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No.**7106.00** for **Highway Rehabilitation** in the city of **Ellsworth**, County of **Hancock**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **June 16, 2006.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is

Section 0001 $_____

Section 0002 $_____

Section 0003 $_____

Performance Bond and Payment Bond each being 100% of the amount awarded under this Contract (see award amount in Section G below).

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the Standard Specifications Revision of December 2002 (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advetisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN. 7106.00 - Highway Rehabilitation - in the city of Ellsworth,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work on the date specified in the Engineer's "Notice to Commence Work" as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted for (see checked boxes):

Section 0001 ❑
Section 0002 ❑
Section 0003 ❑

Contract Amount: _____

This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: David A. Cole, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and **(Name of the firm bidding the job)** a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at **(address of the firm bidding the job)**

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No. **1224.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **West Eastport**, County of **Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **November 15**, 2003**.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is **____(Place bid here in alphabetical form such as One Hundred and Two dollars and 10 cents)_____ $_ (repeat bid here in numerical terms, such as $102.10)_____** Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the Standard Specifications Revision of December 2002 (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 1234.00 West Eastport, Hot Mix Asphalt Overlay,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work on the date specified in the Engineer's "Notice to Commence Work" as stated in Section 107.2 of the Standard Specifications Revision of 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	**(Sign Here)**
Date	(Signature of Legally Authorized Representative of the Contractor)
____(**Witness Sign Here)**	**(Print Name Here)**
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

Date	By: David A. Cole, Commissioner
(Witness)	

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **and the State of** _____, as principal, and……..., a corporation duly organized under the laws of the State of ..... and having a usual place of business ...., as Surety, are held and firmly bound unto the Treasurer of the State of Maine in the sum of _____ **and 00/100 Dollars ($)**, to be paid said Treasurer of the State of Maine or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly and faithfully performs the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the State of Maine.

Signed and sealed this ..... day of ....., 20…. .

WITNESSES:	SIGNATURES: CONTRACTOR:
Signature.....	.....….....
Print Name Legibly	Print Name Legibly ...….....
	SURETY:
Signature	....….....
Print Name Legibly	Print Name Legibly .....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
.....	ADDRESS .....
.....	..….....
.....	.....….....
TELEPHONE.....	.....….....

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **and the State of** _____, as principal, and.....…..... a corporation duly organized under the laws of the State of ..... and having a usual place of business in .....……., as Surety, are held and firmly bound unto the Treasurer of the State of Maine for the use and benefit of claimants as herein below defined, in the sum of _____ **and 00/100 Dollars ($)** for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly satisfies all claims and demands incurred for all labor and material, used or required by him in connection with the work contemplated by said Contract, and fully reimburses the obligee for all outlay and expense which the obligee may incur in making good any default of said Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract.

Signed and sealed this ..... day of ...……....., 20 ... .

WITNESS:	SIGNATURES:
	CONTRACTOR:
Signature…….....	.....….....
Print Name Legibly .....…….	Print Name Legibly …....
	SURETY:
Signature.....	...….....
Print Name Legibly	Print Name Legibly …....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
...….....	ADDRESS ….....
.....	……....
TELEPHONE	……....

General Decision Number: ME030009 07/30/2004 ME9

Superseded General Decision Number: ME020009

State: Maine

Construction Types: Highway

Counties: Aroostook, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Piscataquis, Sagadahoc, Somerset, Waldo and York Counties in Maine.

HIGHWAY CONSTRUCTION PROJECTS excluding major bridging (for example: bascule, suspension and spandrel arch bridges; those bridging waters presently navigating or to be navigatable; and those involving marine construction in any degree); tunnels, building structures in rest area projects and railroad construction.

Modification Number	Publication Date
0	06/13/2003
1	07/30/2004

* ENGI0004-015 04/01/2004

	Rates	Fringes
Power equipment operators:		
Pavers	$ 16.51	6.70
Rollers	$ 16.51	6.70

SUME2000-008 10/24/2000

	Rates	Fringes
Carpenter	$ 11.60	1.51
Ironworkers:		
Structural	$ 12.03	1.58
Laborers:		
Drillers	$ 10.00	2.50
Flaggers	$ 6.00	
Guardrail Installers	$ 7.92	
Landscape	$ 7.87	.16
Line Stripper	$ 8.69	.23
Pipelayers	$ 9.21	2.31
Rakers	$ 9.00	1.51
Sign Erectors	$ 10.00	
Unskilled	$ 8.66	1.38
Wheelman	$ 8.50	.43
Power equipment operators:		
Backhoes	$ 11.87	2.05
Bulldozers	$ 12.33	2.88
Cranes	$ 14.06	1.75
Excavators	$ 12.38	2.48
Graders	$ 13.06	3.73
Loaders	$ 11.41	2.87
Mechanics	$ 13.18	2.57
Truck drivers:		
Dump	$ 9.35	3.10
Tri axle	$ 8.70	1.18

Two axle.....$ 8.56 2.19

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

Project No. 7106(00)E

SPECIAL PROVISION
CONSTRUCTION AREA

A Construction Area located in the **City of Ellsworth** has been established by the Maine Department of Transportation in accordance with provisions of Title 29, Section 1703, Maine Revised Statutes Annotated.

(a) The section of highway under construction beginning at Sta. 1+000.000 and ending at Sta. 2+045.000 of the construction centerline plus approaches.

(b) (Oak & High St's) The section of highway under construction beginning at Sta. 1+000.000 and ending at Sta. 2+045.000 of the new construction centerline plus approaches.

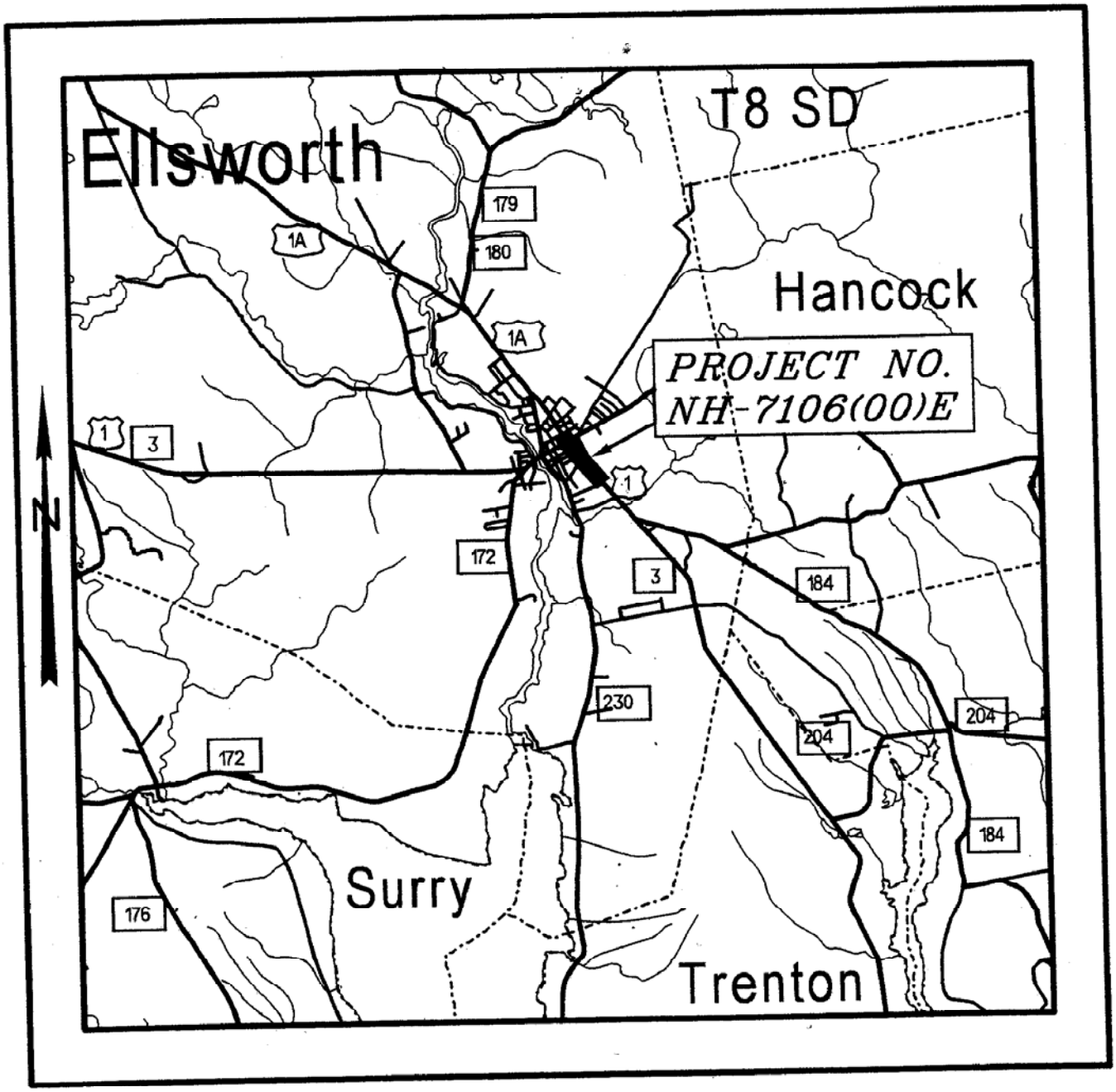
The State Department of Transportation or the State's Engineer may issue permits for stated periods of time for moving construction equipment without loads, low-bed trailers with overloads, over-height, over-width or over-length equipment or materials over all State maintained sections described in the "Construction Area" above and in addition may issue permits for stated periods of time for moving overweight vehicles and loads over the section described in (a) above. The right to revoke such a permit at any time is reserved by the State Department of Transportation and the issuance of such permits shall be subject to any Special Provisions or Supplemental Specifications written for this project.

A Temporary Permit for each move may be issued by the State Department of Transportation or the State's Engineer for moving Contractor's construction equipment used on the project which exceeds the legal limits (shovels, bulldozers, etc.) to sources of construction material over highways maintained by the State reasonably within the area of the project.

The Municipal Officers for the **City of Ellsworth** agreed that a permit will be issued to the Contractor for the purpose of hauling loads in excess of the limits as specified in Title 29, Maine Revised Statues Annotated, on the town ways as described in the "Construction Area" and that single move permits will be issued for moving Contractor's construction equipment used on the project which exceeds the legal limits (shovels, bulldozers, etc.) to sources of construction material over town ways reasonably within the area of the project.

In the event it is necessary to transport gravel, borrow, or other construction material in legally registered vehicles carrying legal loads over town ways, a Contractor's Bond of not more than Nine Thousand ($9,000.00) per kilometer of traveled length may be required by the town, the exact amount of said bond to be determined prior to use of any town way.

The maximum speed limits for trucks on any town way will be forty (40) km per hour [25 mph], unless a higher legal limit is specifically agreed upon in writing by the Municipal Officers concerned.



LOCATION MAP

2 0 2 4

Scale in Kilometers

February 7, 1996
Supersedes
May 8, 1995

SPECIAL PROVISION
CONSTRUCTION AREA

Title 29A, M.R.S.A., Subsection 2383. Overlimit movement permits

1. Overlimit movement permits issued by State. The Secretary of State, acting under guidelines and advice of the Commissioner of Transportation, may grant permits to move non-divisible objects having a length, width, height or weight greater than specified in this Title over a way or bridge maintained by the Department of Transportation.

2. Permit Fee. The Secretary of State, with the advice of the Commissioner of Transportation, may set the fee for these permits, at not less than $3, nor more than $15, based on weight, height, length and width.

3. County and municipal permits. A permit may be granted, for a reasonable fee, by county commissioners or municipal officers for travel over a way or bridge maintained by that county or municipality.

4. Permits for weight. A vehicle granted a permit for excess weight must first be registered for the maximum gross vehicle weight allowed for that vehicle.

5. Special mobile equipment. The Secretary of State may grant a permit, for no more than one year, to move pneumatic-tire equipment under its own power, including Class A and Class B special mobile equipment, over ways and bridges maintained by the Department of Transportation. The fee for that permit is $15 for each 30-day period.

6. Scope of permit. A permit is limited to the particular vehicle or object to be moved and particular ways and bridges.

7. Construction permits. A permit for a stated period of time may be issued for loads and equipment employed on public way construction projects, United States Government projects or construction of private ways, when within construction areas established by the Department of Transportation. The Permit:

   A. Must be procured from the municipal officers for a construction area within that municipality;
   B. May require the Contractor to be responsible for damage to ways used in the construction areas and ma provide for:
      (1) Withholding by the agency contraction the work of final payment under contract; or
      (2) The furnishing of a bond by the Contractor to guarantee suitable repair or payment damages.
   C. May be granted by the Department of Transportation or by the state engineer in charge of the construction contract; and
   D. For construction areas, carries no fee and does not come within the scope of this section.

8. Gross vehicle weight permits. The following may grant permits to operate a vehicle having a gross vehicle weight exceeding the prescribed limit:

A. The Secretary of State, with the consent of the Department of Transportation, for state and state aid highways and bridges within city or compact village limits;
B. Municipal officers, for all other ways and bridges within that city and compact village limits; and
C. The county commissioners, for county roads and bridges located in unorganized territory.

9. Pilot vehicles and state police escorts. Pilot vehicles required by a permit must be equipped with warning lights and signs as required by the Secretary of State with the advice of the Department of Transportation.

Warning lights may only be operated and lettering on the signs may only be visible on a pilot vehicle while it is escorting on a public way a vehicle with a permit.

The Secretary of State shall require a State Police escort for a single vehicle or a combination of vehicles of 125 feet or more in length or 16 feet or more in width. The Secretary of State, with the advice of the Commissioner of Transportation, may require vehicles of lesser dimensions to be escorted by the State Police.

The Bureau of State Police shall establish a fee for State Police escorts.

All fees collected must be used to defray the cost of services provided.

With the advice of the Commissioner of Transportation and the Chief of the State Police, the Secretary of State shall establish rules for the operation for the operation of pilot vehicles.

10. Taxes paid. A permit for a mobile home may not be granted unless the applicant provides reasonable assurance that all property taxes, sewage disposal charges and drain and sewer assessments applicable to the mobile home, including those for the current tax year, have been paid or that the mobile home is exempt from those taxes.

1993, c. 683, § S-2, eff. January 1, 1995.

Historical and Statutory Notes

Derivation:

R.S. 1954, c. 22 § 98
Laws 1955, c. 389
Laws 1967, c. 3.
Laws 1971, c. 593, § 22.
Laws 1973, c. 213.
Laws 1975, c. 130, §
Laws 1975, c. 319, § 2 .
Laws 1977, c. 73, § 5.
Laws 1981, c. 413.
Laws 1985, c. 225, § 1
Laws 1987. c. 52.
Laws 1987, 781, § 3.
Laws 1989, c. 866, § B-13.
Laws 1991, c. 388, § 8.
Laws 1993, c. 683, § A-1.
Former 29 M.R.S.A. § 2382.

Cross Reference

Collection by Secretary of State, See 29-A M.R.S.A. § 154.

SPECIAL PROVISION
SECTION 102.3
EXAMINATION OF DOCUMENTS, SITE AND OTHER INFORMATION
(Geotechnical Information)

Geotechnical Information pertaining to this project has been collected and assembled. Bidders and Contractors are obligated to examine and, if necessary, obtain geotechnical information. Geotechnical Information is available at the Maine Department of Transportation office on Child Street, Augusta, Maine. Geotechnical Information will be provided to interested parties who request this information. Requests for this information should be directed to the Project Manager as outlined in the "Notice to Contractors".

The Department shall not be responsible for Bidder's and Contractor's interpretations of, or estimates or conclusions drawn from, the Geotechnical Information. Data provided may not be representative of the subsurface conditions between the boring locations.

This section does not diminish the duties imposed upon parties in Section 102 or in any other sections.

Town: **Ellsworth**
Project: **NH-7106(00)E, 7106.00**
Date: **June 2, 2004**

SPECIAL PROVISIONS
SECTION 104
Utilities

MEETING

A Preconstruction Utility Conference, as defined in Subsection 104.4.6 of the Standard Specifications **is** required.

GENERAL INFORMATION

These Special Provisions outline the arrangements that have been made by the Department for utility and/or railroad work to be undertaken in conjunction with this project. The following list identifies all known utilities or railroads having facilities presently located within the limits of this project or intending to install facilities during project construction

.

Overview:

Utility/Railroad	Aerial	Underground	Railroad
Adelphia Communications Corporation	X		
Bangor Hydro-Electric Company	X		
Ellsworth Sewer Department		X	
Ellsworth Water Department		X	
Verizon	X	X	
Maine Department of Transportation			X

Temporary utility adjustments are **not** anticipated.

Unless otherwise specified, any underground utility facilities shown on the project plans represent approximate locations gathered from available information. The Department cannot certify the level of accuracy of this data. Underground facilities indicated on the topographic sheets (plan views) have been collected from historical records and/or on-site designations provided by the respective utility companies. Underground facilities indicated on the cross-sections have been carried over from the plan view data and may also include further approximations of the elevations (depths) based upon straight-line interpolation from the nearest manholes, gate valves, or test pits.

All adjustments are to be made by the respective utility/railroad unless otherwise specified herein.

All clearing and tree removal in areas where utilities are involved must be completed before the utilities are able to relocate their facilities.

Fire hydrants shall not be disturbed until all necessary work has been accomplished to provide proper fire protection.

AERIAL

Summary:

Utility	Pole Set	New Wires/ Cables	Trans. Wires/ Cables	Remove Poles	Estimated Working Days
Adelphia Communications Corporation			X		15
Bangor Hydro-Electric Company	X		X	X	50
Verizon			X		30
				Total:	95

Utility Specific Issues:

Bangor Hydro-Electric Company **Bob Peasley (207) 973-2518**
Bangor Hydro-Electric Company (Bangor Hydro) estimates forty **(40)** working days to set and transfer conductors to approximately thirty-one (31) new poles as per the pole list included in this special provision. Bangor Hydro, after all transfers have been completed, estimates ten **(10)** working days to remove the old poles.

Temporary support may be required for poles during excavation for and installation of drainage structures. Temporary support may also be required at other locations. Contact for pole support is Scott Richards and he may be reached at 667-3184. Three (3) days prior notice will be required.

A contractor qualified to work within ten feet of the Bangor Hydro-Electric Company conductors must do any tree removal or tree trimming required within ten feet of the Bangor Hydro-Electric Company conductors. A list of qualified tree removal contractors may be obtained from Bob Peasley and he may be reached at (207) 973-2518.

Adelphia Communications Corporation **Steve Bossie 1-(877) 500-1055 x2421**
After Bangor Hydro installs the new poles, Adelphia Communications Corporation (Adelphia) estimates fifteen **(15)** working days to transfer their cables to the new poles.

Verizon **Dave Leavitt (207) 990-5239**
After Adelphia has completed their transfers, Verizon estimates thirty **(30)** working days to transfer their cables to the new poles.

Town: **Ellsworth**
Project: **NH-7106(00)E, 7106.00**
Date: **June 2, 2004**

Pole List:

Existing Pole #	Existing Station	Left/ Right		Existing Offset	Proposed Station	Left/ Right		Proposed Offset	Comments
		LT	RT			LT	RT		
	1+002.3		X	6.558					OK
	1+052.9	**X**		**6.3**				**7.5**	
	1+053.4		**X**	**6.925**				**9.1**	
	1+082.0		**X**	**8.037**	**1+085**		**X**	**9.1**	
	1+098.6	X		4.771					Eliminate
	1+137.1		**X**	**8.758**	**1+126**		**X**	**9.1**	
	1+155.5	**X**		**11.377**	**0+631**		**X**	**8.2**	
	1+196.2		**X**	**9.469**			**X**	**8.2**	
	1+230.7		**X**	**9.635**			**X**	**8.2**	
	1+259.1		**X**	**9.835**	**1+257**		**X**	**8.2**	
	1+290.6		**X**	**9.596**			**X**	**8.2**	
	1+321.2		**X**	**9.936**			**X**	**8.2**	
	1+353.0		**X**	**9.944**	**1+356**		**X**	**8.2**	
	1+385.6		**X**	**9.901**			**X**	**8.2**	
	1+426.0		**X**	**10.013**	**1+430.5**		**X**	**8.2**	
	1+447.9		**X**	**9.961**			**X**	**8.2**	
	1+485.0		**X**	**10.686**			**X**	**8.2**	
					1+492.8		**X**	**8.2**	Guy Easement needed
	1+495.7	**X**		**7.689**		**X**		**8.2**	
	1+548.4	**X**		**7.782**		**X**		**11.2**	Guy Easement needed
	1+592.5	**X**		**7.915**		**X**		**11.2**	Guy Easement needed
	1+639.5	**X**		**8.135**		**X**		**11.2**	Guy Easement needed
	1+685.2	**X**		**8.290**		**X**		**11.2**	Guy Easement needed
	1+729.3	**X**		**8.417**		**X**		**11.2**	Guy Easement needed
	1+771.8	X		8.471					OK
	1+805.3	X		8.421					OK
	1+838.4	X		8.503					OK
	1+871.2	X		8.636					OK
					1+871.2		**X**	**8.2**	
	1+909.1	**X**		**8.853**		**X**		**9.6**	Guy Easement needed
	1+943.1	**X**		**9.120**		**X**		**9.6**	
	1+981.2	**X**		**8.805**		**X**		**9.6**	
	2+017.2	**X**		**8.902**		**X**		**9.6**	Guy Easement needed
	2+046.9	X		9.615					OK
					2+046.9		**X**	**7.9**	Guy Easement needed

	0+599.4	X		8.046					
	0+621.5		**X**	**7.828**	**0+631**		**X**	**8.1**	
	0+657.0		X	7.707					OK
	0+697.5		**X**	**5.927**				**7.7**	
					1+771.8		X	8.2	OK
					1+871.2		X	8.2	OK

SUBSURFACE

Summary:

Utility	Summary of Work	Estimated Working Days
Ellsworth Wastewater Department	Adjust SMH's to Grade	See below
Ellsworth Water Department	Install new water main Adjust water gate valves Relocate hydrants	See below
Verizon	Adjust MH's to Grade	14
	Total:	14

Utility Specific Issues:

Ellsworth Wastewater Department **Ray Robidoux 667-7315**

The Ellsworth Wastewater Department has a sanitary sewer system within the project limits. The Ellsworth Wastewater Department has entered into an agreement with the Department to include wastewater work in the contract documents. This work includes rebuilding and adjusting sewer manholes to grade as indicated below. The Contractor shall include the sanitary sewer work in the schedule for construction. The Ellsworth Wastewater Department requires three (3) working days notice prior to the contractor beginning any work on the sewer manholes.

Item # 812.162 Adjust Manhole or Catch Basin to grade

0+998	2.7 Lt	1+146	1.3 Rt	1+218.5	1.7 Rt	1+310	2.2 Rt
1+423.8	1.8 Rt	1+511.2	1.5 Rt	1+544.3	1.8 Rt	1+637.2	1.1 Rt
1+758	0.7 Rt	1+808.5	1.5 Rt	1+877	1.0 Rt	1+933.9	1.0 Rt
2+007.7	0.7 Rt	2+022.8	5.8 Rt				

Item # 812.164 Rebuilding Manhole

0+668.3 0.1 Lt. 1+083.8 1.2 Lt

Ellsworth Water Department **Larry Wilson 667-8632**

The Ellsworth Water Department has entered into an agreement with the Department for work, as shown in Appendix A, to be performed by the Department's contractor as part of this contract. The contractor shall include the water work in the schedule for construction. The Ellsworth Water Department requires three (3) working days notice prior to the contractor beginning any work on the water facilities.

Verizon **Dave Leavitt 990-5239**

Verizon estimates seven (7) manholes to adjust to grade and estimates fourteen (**14**) working days to complete their work. Verizon requires three (3) working days notice prior to the contractor beginning any work around the manholes.

RAILROAD

Maine Department of Transportation

Maine Department of Transportation has Railroad Right of Way which parallels this project. No conflicts are anticipated.

SPECIAL PROVISION
SECTION 105
(General Scope of Work)

The Contractor is advised that all work from Sta. 1+000 to Sta. 1+170 shall be conducted between the hours of 7:00 pm and 6:00 am and the dates of July 1, 2005 to September 6, 2005.

SPECIAL PROVISION
SECTION 105
LEGAL RELATIONS WITH AND RESPONSIBILITY TO PUBLIC
(NPDES)

105.8.2 Permit Requirements This Section is revised by the addition of the following paragraph:

"The Contractor is advised that the Environmental Protection Agency has issued a final National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges from construction sites disturbing more than 2 ha [5 acres]. This permit requires:

- Storm Water Pollution Prevention Plan
- Submission of a Notification of Intent (NOI) at least 48 hours before construction commences
- Submission of a Notification of Termination (NOT) when a site has been finally stabilized and all storm water discharges from construction activities are eliminated.

If the project's land disturbances is 2 ha [5 acres] or more, the Department will prepare the plan and submit the NOI (and NOT). The Contractor shall prepare plans and submit NOI's (and NOT's) for regulated construction activities beyond the project limits (e.g., borrow pits).

The Contractor shall be familiar with and comply with these regulations."

SPECIAL PROVISION
SECTION 107
TIME
(Night Work)
and
(Supplemental Liquidated Damages)

Supplemental Liquidated Damages will be assessed to the Contractor in the amount of $250.00 per 15 minutes or any part thereof that the night work is not ready and open to traffic on completed aggregate subbase course after 6:00 am.

SPECIAL PROVISION
SECTION 107
TIME
(Limitation of Operations)
and
(Supplemental Liquidated Damages)

Where existing pavement carries traffic and is removed to install (or remove) drainage or utility structures, the pavement shall be replaced weekly with a temporary pavement or base course consisting of a minimum of 75 mm [3 inches] of acceptable hot mix asphalt. No separate payment will be made for furnishing, placing, maintaining, and removing temporary pavement and all cost for temporary pavement will be considered incidental to the contract.

Once work at the intersection of Main St., Oak St., and High St. begins, it shall be continuous through completion up to base course pavement before work can begin in other locations.

Supplemental liquidated damages shall be assessed the Contractor in the amount of Three Hundred Dollars ($300.00) per day for each calendar day, that the above work remains incomplete beyond the limits described above.

SPECIAL PROVISION
SECTION 107
TIME
(Schedule of Work)

Description - The Contractor shall submit to the Resident a schedule of work for approval. The schedule of work shall be used to monitor the sequence of construction operations and the progress of work.

The Schedule of Work shall be in the form specified herein.

Critical Path Method Schedule - The construction of this project shall be planned and recorded with a Critical Path Method (CPM) schedule in the form of an activity on node (AON) diagram. The schedule shall be used for coordinating and monitoring all work under the contract including the activity of subcontractors, vendors, and suppliers.

Preparation of Bid Schedule - Each bidder shall submit a schedule of the work to indicate the scheduled dates or completion of components of the project. It shall include approval, fabrication, and delivery precedent to the performance of the major components of the project. The schedule shall contain a minimum of 50 activities. The schedule can be in a bar chart format. The schedule must demonstrate the Contractor's understanding of the project and ability to:

1. Complete the work by the contract completion date.

2. Meet the milestones specified in Section 107.4 entitled Scheduling of Work.

Preparation of Initial Schedule - Within 15 calendar days of contract award, the Contractor shall submit for the Resident's approval a detailed initial schedule. The schedule shall meet the requirements set forth herein.

Within 15 calendar days of the Contractor's submittal, the Resident will review the schedule and provide the Contractor in writing corrections needed to approve the schedule. The Contractor must make all corrections and resolve all comments within 60 calendar days of the Notice to Commence work. If the schedule is not approved within 60 calendar days of the Notice to Commence work, the Department will withhold all contract payments until the schedule is approved.

The approval of the schedule by the Resident in no way attests to the validity of the assumptions, logic constraints, dependency relationships, resource allocations, manpower and equipment, or any other aspect of the proposed schedule. The Contractor is and shall remain solely responsible for the planning and execution of work in order to meet project milestones or contract completion dates.

The construction time for the entire project, or any milestone, shall not exceed the specified contract time. Logic or activity durations will be revised in the event that any milestone or contract completion date is exceeded in the schedule.

In the event that a Contractor submits a schedule with a completion time before the contract completion time, the Contractor agrees that the Department will not be liable for any compensable delay claims related to the period between the Contractor's scheduled completion time and the contract completion time unless the Contractor can demonstrate that (a) the early completion time was anticipated by the Contractor during bid preparation and is reflected in the bid, (b) the early completion schedule is reasonable, (c) the Contractor consistently utilized the early completion schedule to schedule, coordinate and manage the work including monitoring progress, (d) the cause(s) of the delay(s) were solely attributable to the Department, (e) the delays incurred impacted the critical path, (f) the Contractor did not cause any concurrent delays to the critical path, and (g) the Contractor was not able to perform other critical path work during the delay period.

Schedule Requirements:

1. Activity Information: All activity on node diagrams shall include:

a. Activity ID
b. Activity Description
c. Finish to Start relationships with no leads or lags

2. Duration (Working Days): No activity will have duration greater than 15 working days or less than one working day. Activity durations expressed in hours will not be allowed unless approved by the Resident. If requested by the Resident, the Contractor shall furnish any information needed to justify the reasonableness of activity time durations. Such information shall include, but not be limited to, estimated activity manpower, unit quantities, and production rates.

3. Procurement and Submittals: Separate procurement into at least two activities, fabrication and delivery. When the procurement also requires a submittal to and approval by the Department, insure these separate activities are shown in the schedule logic. Insure all work activities that require a submittal are preceded by submittal and approval activities.
4. Constraints: Use only contractual constraints in the schedule logic. No other constraints are allowed unless approved by the Resident. The disallowance of constraints includes the use of activity mandatory start and finish dates.

5. Float: Float is defined as the amount of time between when an activity "can start" (the early start) and when an activity "must start" (the late start). It is understood by the Department and the Contractor that float is a shared commodity, not for the exclusive use of financial benefit of either party. Either party has the full use of the float until it is depleted.

6. Activity Codes: Activities shall be identified by codes to reflect the following information related to an activity:

Responsible party for the accomplishment of each activity (only one party can be responsible for an activity).

Phase/stage as required by the maintenance and protection of traffic plan and/or the Special Provisions.

Area/Location

7. Computer Compatibility: The CPM schedule must be processed through a computer and be compatible with Primavera Project Planner software, version 5.0 or later, by Primavera Systems Inc., Bala Cynwynd, PA. It is the Contractor's responsibility to ascertain the software compatibility with the Resident.

Initial Schedule Submittal Requirements:

1. Predecessor/Successor Sort

2. Total Float/Early Start Sort

3. Responsibility/Early Start Sort

4. Area/Early Start Sort

5. Logic Diagram: produce diagram with not greater than 100 activities per ANSI D (24-inch x 36-inch) size sheet. Insure each sheet includes title, match data or diagram correlation, and key to identify all components used in the diagram.

6. Narrative discussing general approach to completion of the work.

Schedule Updates - The Contractor shall update the schedule bi-weekly during active work until roadway is open to traffic to show current progress. The data date for the update shall be determined by the Resident. The schedule update shall be submitted within seven calendar days of the data date. The Resident may require submission of the updated schedule on diskette prior to submission of the full update package. Should the

Contractor fail to provide an update, the Department may withhold payment of the current monthly progress estimate until the monthly schedule update is submitted. The update will include:

1. Dates of activities' actual start and completion.

2. The percent of work remaining for activities started, but not complete as of the update date.

3. Narrative report including a listing of monthly progress, the activities that define the critical path and any changes to the path of critical activities from the previous update, sources of delay, any potential problems, requested logic changes, and work planned for the next month.

4. Predecessor/Successor Sort

5. Total Float/Early Start Sort

6. Responsibility/Early Start Sort

7. Area/Early Start Sort

8. Diskette in Primavera (P3) format

9. Fragnet of logic diagram for all requested logic changes

10. Updated logic diagram as required by the Resident. At a minimum, the Department shall require a final logic diagram at the end of the project showing the planned and actual starts and completions.

11. A bar chart comparison of the updated schedule to the initial schedule. This diagram shall show actual and planned performance dates for all completed activities.

Schedule Revisions - The Contractor will revise the schedule for the following: a delay in completion of the project or contractual milestones or actual prosecution of the work which is, as determined by the Resident, significantly different than that represented on the schedule: Schedule revisions will be considered incidental to Pay Item 107.51.

Recovery Schedule - If the initial schedule or current updates fail to reflect the project's actual plan or method of operation, or a contract milestone date is more than 30 calendar days behind, the Department may require that a recovery schedule for completion of the remaining contract work be submitted. The recovery Schedule must be submitted within

seven calendar days of the Department's request. The Recovery Schedule shall describe in detail the Contractor's plan to complete the remaining contract work by the contract milestone date. The Recovery Schedule submittal shall meet the same schedule requirements as the Initial Schedule. The narrative submitted with the Recovery Schedule should describe in detail all changes that have been made to meet the contract milestone date.

Change Orders - When a change order is proposed, the Contractor must identify all logic changes required as a result of the change order. The Contractor shall include, as part of each change order proposal, a sketch showing all schedule logic revisions, duration changes, and the relationships to other activities in the approved Initial Schedule. This sketch shall be known as the fragment for the change. Upon acceptance of the fragment, the Contractor will revise the Initial Schedule or current update. The logic change work required by the change order will be considered incidental to the contract work. No separate payment will be made.

Schedule Revisions to Utility Work - The Contractor shall provide the utilities ten days notice when revisions in the schedule of work affect operations of a utility unless previous arrangements have been made with the utility company involved.

Method of Measurement - Schedule of work will be measured for payment as one lump sum for the initial schedule and payments for each update.

Basis of Payment - Schedule of work will be paid for at the contract lump sum price. Upon approval of the initial schedule, the contract lump sum price for the initial schedule will be paid. Thereafter, biweekly schedule updates will be paid for at the contract unit price each.

Payment will be made under:

Pay Item	Pay Unit
107.51 Prosecution of Work - Initial Schedule	Lump Sum
107.53 Prosecution of Work - Biweekly Update	Each

SPECIAL PROVISION
SECTION 107
TIME

The specified contract completion date is June 16, 2006.

SPECIAL PROVISION
(Consolidated Special Provisions)

SPECIAL PROVISION SECTION 101
CONTRACT INTERPRETATION

101.2 Definitions - Closeout Documentation

Replace the sentence "A letter stating the amount….. DBE goals." with "DBE Goal Attainment Verification Form"

SPECIAL PROVISION SECTION 102
DELIVERY OF BIDS
(Location and Time)

102.7.1 Location and Time Add the following sentence "As a minimum, the Bidder will submit a Bid Package consisting of the Notice to Contractors, the completed Acknowledgement of Bid Amendments & Submission of Bid Bond Validation Number form, the completed Schedule of Items, 2 copies of the completed Agreement, Offer, & Award form, a Bid Bond or Bid Guarantee, and any other Certifications or Bid Requirements listed in the Bid Book."

SPECIAL PROVISION SECTION 103
AWARD AND CONTRACTING

103.3.1 Notice and Information Gathering Change the first paragraph to read as follows: "After Bid Opening and as a condition for Award of a Contract, the Department may require an Apparent Successful Bidder to demonstrate to the Department's satisfaction that the Bidder is responsible and qualified to perform the Work."

SPECIAL PROVISION SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES

Delete the entire Section 104.5.9 and replace with the following:

104.5.9 Landscape Subcontractors The Contractor shall retain only Landscape Subcontractors that are certified by the Department's Environmental Office Landscape Unit.

SPECIAL PROVISION SECTION 105
GENERAL SCOPE OF WORK

Delete the entire Section 105.6 and replace with the following:

105.6.1 Department Provided Services The Department will provide the Contractor with the description and coordinates of vertical and horizontal control points, set by the Department, within the Project Limits, for full construction Projects and other Projects where survey control is necessary. For Projects of 1,500 feet in length, or less: The Department will provide three points. For Projects between 1,500 and 5,000 feet in length: The Department will provide one set of two points at each end of the Project. For Projects in excess of 5,000 feet in length, the Department will provide one set of two points at each end of the Project, plus one additional set of two points for each mile of Project length. For non-full construction Projects and other Projects where survey control is not necessary, the Department will not set any control points and, therefore, will not provide description and coordinates of any control points. Upon request of the Contractor, the Department will provide the Department's survey data management software and Survey Manual to the Contractor, or its survey Subcontractor, for the exclusive use on the Department's Projects.

105.6.2 Contractor Provided Services Utilizing the survey information and points provided by the Department, described in Subsection 105.6.1, Department Provided Services, the Contractor shall provide all additional survey layout necessary to complete the Work. This may include, but not be limited to, reestablishing all points provided by the Department, establishing additional control points, running axis lines, providing layout and maintenance of all other lines, grades, or points, and survey quality control to ensure conformance with the Contract. The Contractor is also responsible for providing construction centerline, or close reference points, for all Utility Facilities relocations and adjustments as necessary to complete the Work. When the Work is to connect with existing Structures, the Contractor shall verify all dimensions before proceeding with the Work. The Contractor shall employ or retain competent engineering and/or surveying personnel to fulfill these responsibilities.

The Contractor must notify the Department of any errors or inconsistencies regarding the data and layout provided by the Department as provided by Section 104.3.3 - Duty to Notify Department If Ambiguities Discovered.

105.6.2.1 Survey Quality Control The Contractor is responsible for all construction survey quality control. Construction survey quality control is generally defined as, first, performing initial field survey layout of the Work and, second, performing an independent check of the initial layout using independent survey data to assure the accuracy of the initial layout; additional iterations of checks may be required if significant discrepancies are discovered in this process. Construction survey layout quality control also requires written documentation of the layout

process such that the process can be followed and repeated, if necessary, by an independent survey crew.

105.6.3 Survey Quality Assurance It is the Department's prerogative to perform construction survey quality assurance. Construction survey quality assurance may, or may not, be performed by the Department. Construction survey quality assurance is generally defined as an independent check of the construction survey quality control. The construction survey quality assurance process may involve physically checking the Contractor's construction survey layout using independent survey data, or may simply involve reviewing the construction survey quality control written documentation. If the Department elects to physically check the Contractor's survey layout, the Contractor's designated surveyor may be required to be present. The Department will provide a minimum notice of 48 hours to the Contractor, whenever possible, if the Contractor's designated surveyor's presence is required. Any errors discovered through the quality assurance process shall be corrected by the Contractor, at no additional cost to the Department.

105.6.4 Boundary Markers The Contractor shall preserve and protect from damage all monuments or other points that mark the boundaries of the Right-of-Way or abutting parcels that are outside the area hat must be disturbed to perform the Work. The Contractor indemnifies and holds harmless the Department from all claims to reestablish the former location of all such monuments or points including claims arising from 14 MRSA § 7554-A. For a related provision, see Section 104.3.11 - Responsibility for Property of Others.

SPECIAL PROVISION SECTION 106
QUALITY

106.6 Acceptance Add the following to paragraph 1 of A: "This includes Sections 401 - Hot Mix Asphalt, 402 - Pavement Smoothness, and 502 - Structural Concrete - Method A - Air Content."

Add the following to the beginning of paragraph 3 of A: "For pay factors based on Quality Level Analysis, and"

SPECIAL PROVISION SECTION 107
TIME

107.3.1 General Add the following: "If a Holiday occurs on a Sunday, the following Monday shall be considered a Holiday. Sunday or Holiday work must be approved by the Department, except that the Contractor may work on Martin Luther King Day, President's Day, Patriot's Day, the Friday after Thanksgiving, and Columbus Day without the Department's approval."

107.7.2 Schedule of Liquidated Damages Replace the table of Liquidated Damages with the following:

From More Than	Up to and Including	Amount of Liquidated Damages per Calendar Day
$0	$100,000	$100
$100,000	$300,000	$200
$300,000	$500,000	$400
$500,000	$1,000,000	$575
$1,000,000	$2,000,000	$750
$2,000,000	$4,000,000	$900
$4,000,000	and more	$1,875

SPECIAL PROVISION SECTION 108
PAYMENT

108.4 Payment for Materials Obtained and Stored First paragraph, second sentence, delete the words "…Delivered on or near the Work site at acceptable storage places."

SPECIAL PROVISION SECTION 109
CHANGES

109.1.1 Changes Permitted Add the following to the end of the paragraph: "There will be no adjustment to Contract Time due to an increase or decrease in quantities, compared to those estimated, except as addressed through Contract Modification(s)."

109.1.2 Substantial Changes to Major Items Add the following to the end of the paragraph: "Contract Time adjustments may be made for substantial changes to Major Items when the change affects the Critical Path, as determined by the Department"

109.4.4 Investigation / Adjustment In the third sentence, delete the words "subsections (A) - (E)"

109.5.1 Definitions - Types of Delays

B. Compensable Delay Replace (1) with the following; "a weather related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an Equitable Adjustment if the Project falls within the geographic boundaries prescribed under the disaster declaration."

109.7.2 Basis of Payment Replace with the following: "Equitable Adjustments will be established by mutual Agreement for compensable items listed in Section 109.7.3-

Compensable Items, based upon Unit or Lump Sum Prices. If Agreement cannot be reached, the Contractor shall accept payment on a Force Account basis as provided in Section 109.7.5 - Force Account Work, as full and complete compensation for all Work relating to the Equitable Adjustment."

109.7.3 Compensable Items Replace with the following: "The Contractor is entitled to compensation for the following items, with respect to agreed upon Unit or Lump Sum Prices:

1. Labor expenses for non-salaried Workers and salaried foremen.

2. Costs for Materials.

3. A markup on the totals of Items 1 and 2 of this subsection 109.7.3 for home office overhead and profit of the Contractor, its Subcontractors and suppliers, and any lower tier Subcontractors or suppliers, with no mark-ups on mark-ups.

4. Cost for Equipment, based on Blue Book Rates or leased rates, as set forth in Section 109.7.5(C), or the Contractor's Actual Costs.

5. Costs for extended job-site overhead.

6. Time.

7. Subcontractor quoted Work, as set forth below in Section 109.7.5 (F)."

109.7.5 Force Account Work

C. Equipment

Paragraph 2, delete sentence 1 which starts; "Equipment leased…."

Paragraph 6, change sentence 2 from "The Contractor may furnish…" to read "If requested by the Department, the Contractor will produce cost data to assist the Department in the establishment of such rental rate, including all records that are relevant to the Actual Costs including rental Receipts, acquisition costs, financing documents, lease Agreements, and maintenance and operational cost records."

Add the following paragraph; "Equipment leased by the Contractor for Force Account Work and actually used on the Project will be paid for at the actual invoice amount plus 10% markup for administrative costs."

Add the following section;

"F. Subcontractor Quoted Work When accomplishing Force Account Work that utilizes Subcontractor quoted Work, the Contractor will be allowed a maximum markup of 5% for profit and overhead."

SPECIAL PROVISION SECTION 110
INDEMNIFICATION, BONDING, AND INSURANCE

Delete the entire Section 110.2.3 and replace with the following:

110.2.3 Bonding for Landscape Establishment Period The Contractor shall provide a signed, valid, and enforceable Performance, Warranty, or Maintenance Bond complying with the Contract, to the Department at Final Acceptance.

The bond shall be in the full amount for all Pay Items for work pursuant to Sec 621, Landscape, payable to the "Treasurer - State of Maine," and on the Department's forms, on exact copies thereof, or on forms that do not contain any significant variations from the Department's forms as solely determined by the Department.

The Contractor shall pay all premiums and take all other actions necessary to keep said bond in effect for the duration of the Landscape Establishment Period described in Special Provision 621.0036 - Establishment Period. If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new bonds complying with this Section within 10 Days of the date the Contractor is notified or becomes aware of such change.

All Bonds shall be procured from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Business Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

By issuing a bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time for performance, quality, warranties, and the Department's self-help remedy provided in Section 112.1 - Default to the same extent as if all terms of the Contract are contained in the bond(s).

Regarding claims related to any obligations covered by the bond, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-day period constitutes the Surety's waiver of any right to

deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

SPECIAL PROVISION SECTION 401
HOT MIX ASPHALT PAVEMENT

401.18 Quality Control Method A & B Make the following change to paragraph a. QCP Administrator; in the final sentence, change "…certified as a Plant Technician or Paving Inspector…" to "…certified as a Quality Assurance Technologist…"

401.201 Method A Under a. Lot Size, add the following; "Each lot will be divided into a minimum of four sublots for mix properties and five sublots for percent TMD."

SPECIAL PROVISION SECTION 402
PAVEMENT SMOOTHNESS

Add the following: "Projects to have their pavement smoothness analyzed in accordance with this Specification will be so noted in Special Provision 403 - Bituminous Box."

"402.02 Lot Size Lot size for smoothness will be 1000 lane-meters [3000 lane-feet]. A sublot will consist of 20 lane-meters [50 lane-feet]. Partial lots will be included in the previous lot if less than one-half the size of a normal lot. If greater than one-half the normal lot size, it will be tested as a separate lot."

SPECIAL PROVISION SECTION 502
STRUCTURAL CONCRETE

502.05 Composition and Proportioning; TABLE #1; NOTE #2; third sentence; Change "…alcohol based saline sealer…" to "alcohol based silane sealer…"

502.0502 Quality Assurance Method A - Rejection by Resident Change the first sentence to read: "For an individual sublot with test results failing to meet the criteria in Table #1, or if the calculated pay factor for Air Content is less than 0.80……"

502.0503 Quality Assurance Method B - Rejection by Resident Change the first sentence to read: "For material represented by a verification test with test results failing to meet the criteria in Table #1, the Department will……"

502.0505 Resolution of Disputed Acceptance Test Results Combine the second and third sentence to read: "Circumstances may arise, however, where the Department may ……"

502.10 Forms and False work

D. Removal of Forms and False work 1., First paragraph; first, second, and third sentence; replace "forms" with "forms and false work"

502.11 Placing Concrete

G. Concrete Wearing Surface and Structural Slabs on Precast Superstructures Last paragraph; third sentence; replace "The temperature of the concrete shall not exceed 24° C [75° F} at the time of placement." with "The temperature of the concrete shall not exceed 24° C [75° F} at the time the concrete is placed in its final position."

502.15 Curing Concrete First paragraph; replace the first sentence with the following; "All concrete surfaces shall be kept wet with clean, fresh water for a curing period of at least 7 days after concrete placing, with the exception of vertical surfaces as provided for in Section 501.10 (D) - Removal of Forms and False work."

Second paragraph; delete the first two sentences.

Third paragraph; delete the entire paragraph which starts "When the ambient temperature…."

Fourth paragraph; delete "approved" to now read "…continuously wet for the entire curing period…"

Fifth paragraph; second sentence; change "…as soon as it is possible to do so without damaging the concrete surface." to "…as soon as possible."

Seventh paragraph; first sentence; change "…until the end of the curing period." to "…until the end of the curing period, except as provided for in Section 502.10(D) - Removal of Forms and False work."

SPECIAL PROVISION SECTION 503
REINFORCING STEEL

503.06 Placing and Fastening Change the second paragraph, first sentence from: "All tack welding shall be done in accordance with Section 504, Structural Steel." to "All tack welding shall be done in accordance with AWS D1.4 Structural Welding Code - Reinforcing Steel."

SPECIAL PROVISION SECTION 504
STRUCTURAL STEEL

504.18 Plates for Fabricated Members Change the second paragraph, first sentence from: "…ASTM A 898/A 898 M…" to "…ASTM A 898/A 898 M or ASTM A 435/A 435 M as applicable and…"

SPECIAL PROVISION SECTION 535
PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

535.02 Materials Change "Steel Strand for Concrete Reinforcement" to "Steel Strand." Add the following to the beginning of the third paragraph; "Concrete shall be Class P conforming to the requirements in this section. 28 day compressive strength shall be as stated on the plans. Coarse aggregate…."

535.26 Lateral Post-Tensioning Replace the first paragraph; "A final tension…" with "Overstressing strands for setting losses cannot be accomplished for chuck to chuck lengths of 7.6 m [25 ft] and less. In such instances, refer to the Plans for all materials and methods. Otherwise, post-tensioning shall be in accordance with PCI standards and shall provide the anchorage force noted in the Plans. The applied jacking force shall be no less than 100% of the design jacking force."

SPECIAL PROVISION SECTION 603
PIPE CULVERTS AND STORM DRAINS

603.0311 Corrugated Polyethylene Pipe for Option III Replace the Minimum Mandrel Diameter Table with the following:

Nominal Size US Customary (in)	Minimum Mandrel Diameter (in)	Nominal Size Metric (mm)	Minimum Mandrel Diameter (mm)
12	11.23	300	280.73
15	14.04	375	350.91
18	16.84	450	421.09
24	22.46	600	561.45
30	28.07	750	701.81
36	33.69	900	842.18
42	39.30	1050	982.54
48	44.92	1200	1122.90

SPECIAL PROVISION SECTION 604
MANHOLES, INLETS, AND CATCH BASINS

604.02 Materials Add the following:

"Tops and Traps	712.07
Corrugated Metal Units	712.08
Catch Basin and Manhole Steps	712.09"

SPECIAL PROVISION SECTION 605
UNDERDRAINS

605.05 Underdrain Outlets Make the following change:

In the first paragraph, second sentence, delete the words "metal pipe".

SPECIAL PROVISION SECTION 606
GUARDRAIL

606.02 Materials Delete the entire paragraph which reads "The sole patented supplier of multiple mailbox…." and replace with "Acceptable multiple mailbox assemblies shall be listed on the Department's Approved Products List and shall be NCHRP 350 tested and approved."

Delete the entire paragraph which reads "Retroreflective beam guardrail delineators…." and replace with "Reflectorized sheeting for Guardrail Delineators shall meet the requirements of Section 719.01 - Reflective Sheeting. Delineators shall be fabricated from high-impact, ultraviolet and weather resistant thermoplastic.

606.09 Basis of Payment First paragraph; delete the second and third sentence in their entirety and replace with "Butterfly-type guardrail reflectorized delineators shall be mounted on all W-beam guardrail at an interval of every 10 posts [62.5 ft] on tangents sections and every 5 posts [31.25 ft] on curved sections as directed by the Resident. On divided highways, the delineators shall be yellow on the left hand side and silver/white on the right hand side. On two-way roadways, the delineators shall be silver/white on the right hand side. All delineators shall have retroreflective sheeting applied to only the traffic facing side. Reflectorized guardrail delineators will not be paid for directly, but will be considered incidental to the guardrail items."

SPECIAL PROVISION SECTION 615
LOAM

615.02 Materials Make the following change:

Organic Content	Percent by Volume
Humus	"5% - 10%", as determined by Ignition Test

SPECIAL PROVISION SECTION 618
SEEDING

618.01 Description Change the first sentence to read as follows: "This work shall consist of furnishing and applying seed ….." Also remove ",and cellulose fiber mulch" from 618.01(a).

618.03 Rates of Application In 618.03(a), remove the last sentence and replace with the following: "These rates shall apply to Seeding Method 2, 3, and Crown Vetch."

In 618.03(c) "1.8 kg [4 lb]/unit." to "1.95 kg [4 lb]/unit."

618.09 Construction Method In 618.09(a) 1, sentence two, replace "100 mm [4 in]" with "25 mm [1 in] (Method 1 areas) and 50 mm [2 in] (Method 2 areas)"

618.15 Temporary Seeding Change the Pay Unit from Unit to Kg [lb].

SPECIAL PROVISION SECTION 620
GEOTEXTILES

620.03 Placement Section (c)

Title: Replace "Non-woven" in title with "Erosion Control".
First Paragraph: Replace first word "Non-woven" with "Woven monofilament".
Second Paragraph: Replace second word "Non-woven" with "Erosion Control".

620.07 Shipment, Storage, Protection and Repair of Fabric Section (a)

Replace the third sentence with the following: "Damaged geotextiles, as identified by the Resident, shall be repaired immediately."

620.09 Basis of Payment

Pay Item 620.58: Replace "Non-woven" with "Erosion Control"
Pay Item 620.59: Replace "Non-woven" with "Erosion Control"

SPECIAL PROVISION SECTION 621
LANDSCAPING

621.0036 Establishment Period In paragraph 4 and 5, change "time of Final Acceptance" to "end of the period of establishment". In Paragraph 7, change "Final Acceptance date" to ""end

of the period of establishment" and change "date of Final Acceptance" to "end of the period of establishment".

SPECIAL PROVISION SECTION 626
HIGHWAY SIGNING

626.034 Concrete Foundations Add to the following to the end of the second paragraph: "Pre-cast and cast-in-place foundations shall be warranteed against leaning and corrosion for two years after the project is completed. If the lean is greater than 2 degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at no extra cost."

SPECIAL PROVISION SECTION 637
DUST CONTROL

637.06 Basis of Payment Add the following after the second sentence of the third paragraph: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 637 and/or the Contractor's own Soil Erosion and Pollution Control Plan concerning Dust Control and/or the Contractor's own Traffic Control Plan concerning Dust Control and/or visible evidence of excessive dust problems, as determined by the Resident, will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item. Additional penalties may also be assessed in accordance with Special Provision 652 - Work Zone Traffic Control and Standard Specification 656 - Temporary Soil Erosion and Water Pollution Control."

SPECIAL PROVISION SECTION 639
ENGINEERING FACILITIES

639.04 Field Offices Change the forth to last paragraph from: "The Contractor shall provide a fully functional desktop copier…" to "….desktop copier/scanner…"

SPECIAL PROVISION SECTION 652
MAINTENANCE OF TRAFFIC

652.3.5 Installation of Traffic Control Devices In the first paragraph, first sentence; change "Signs shall be erected…" to "Portable signs shall be erected…" In the third sentence; change

"Signs must be erected so that the sign face…" to "Post-mounted signs must also be erected so that the sign face…"

652.8.2 Other Items Replace the last paragraph with the following: "There will be no payment made under any 652 pay items after the expiration of the adjusted total contract time."

SPECIAL PROVISION SECTION 653
POLYSTYRENE PLASTIC INSULATION

653.05 Placing Backfill In the second sentence; change "…shall be not less than 150 mm [6 in] loose measure." to "…shall be not less than 250 mm [10 in] loose measure." In the third sentence; change "…crawler type bulldozer of not more than 390 kg/m^2 [80 lb/ft^2] ground contact pressure…" to "…crawler type bulldozer of not more than 4875 kg/m^2 [2000 lb/ft^2] ground contact pressure…"

653.06 Compaction In the last sentence; change "…crawler type bulldozer of not more than 390 kg/m^2 [80 lb/ft^2] ground contact pressure…" to "…crawler type bulldozer of not more than 4875 kg/m^2 [2000 lb/ft^2] ground contact pressure…"it]."

SPECIAL PROVISION SECTION 656
TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

656.5.1 If Pay Item 656.75 Provided Replace the second paragraph with the following: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 656 and/or the Contractor's own Soil Erosion and Pollution Control Plan will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item."

SPECIAL PROVISION SECTION 703
AGGREGATES

703.06 Aggregate for Base and Subbase Delete the first paragraph: "The material shall have…" and replace with "The material shall have a minimum degradation value of 15 as determined by Washington State DOT Test Method T113, Method of Test for Determination of Degradation Value (March 2002 version), except that the reported degradation value will be the result of testing a single specimen from that portion of a sample that passes the 12.5 mm [½ in] sieve and is retained on the 2.00 mm [No. 10] sieve, minus any reclaimed asphalt pavement used."

703.07 Aggregates for HMA Pavements Delete the forth paragraph: "The composite blend shall have…" and replace with "The composite blend, minus any reclaimed asphalt pavement used, shall have a Micro-Deval value of 18.0 or less as determined by AASHTO TP 58. In the event the material exceeds the Micro Deval limit, a Washington Degradation test shall be performed. The material shall be acceptable if it has a value of 30 or more as determined by Washington State DOT Test Method T 113, Method of Test for Determination of Degradation Value (March 2002 version) except that the reported degradation value will be the result of testing a single composite specimen from that portion of the sample that passes the 12.5mm [1/2 inch] sieve and is retained on the 2.00mm [No 10] sieve, minus any reclaimed asphalt pavement used."

703.22 Underdrain Backfill Material Change the first paragraph from "…for Underdrain Type B…" to "…for Underdrain Type B and C…"

SPECIAL PROVISION SECTION 706
NON-METALLIC PIPE

706.06 Corrugated Polyethylene Pipe for Underdrain, Option I and Option III Culvert Pipe Change the first sentence from "…300 mm diameters to 900 mm" to "…300 mm diameters to 1200 mm" Delete, in it's entirety, the last sentence which begins "This pipe and resins…" and replace with the following; "The manufacturing plants of polyethylene pipe shall be certified by the Eastern States Consortium. Polyethylene pipe shall be accepted based on third party certification by the AASHTO's National Transportation Product Evaluation Program."

SPECIAL PROVISION SECTION 709
REINFORCING STEEL AND WELDED STEEL WIRE FABIC

709.03 Steel Strand Change the second paragraph from "…shall be 12mm [½ inch] AASHTO M203M/M203 (ASTM A416/A416M)…" to "…shall be 15.24 mm [0.600 inch] diameter AASHTO M203 (ASTM A416)…"

SPECIAL PROVISION SECTION 712
MISCELLANEOUS HIGHWAY MATERIALS

Add the following:

"712.07 Tops, and Traps These metal units shall conform to the plan dimensions and to the following specification requirements for the designated materials.

Gray iron castings shall conform to the requirements of AASHTO M105, Class 30, unless otherwise designated.

Carbon steel castings shall conform to the requirements of AASHTO M103/M103M. Grade shall be 450-240 [65-35] unless otherwise designated.

Structural steel shall conform to the requirements of AASHTO M183/M183M or ASTM A283/A283M, Grade B or better. Galvanizing, where specified for these units, shall conform to the requirements of AASHTO M111.

712.08 Corrugated Metal Units The units shall conform to plan dimensions and the metal to AASHTO M36/M36M. Bituminous coating, when specified, shall conform to AASHTO M190 Type A.

712.09 Catch Basin and Manhole Steps Steps for catch basins and for manholes shall conform to ASTM C478M [ASTM C478], Section 13 for either of the following material:

(a) Aluminum steps-ASTM B221M, [ASTM B211] Alloy 6061-T6 or 6005-T5.

(b) Reinforced plastic steps Steel reinforcing bar with injection molded plastic coating copolymer polypropylene. Polypropylene shall conform to ASTM D 4101.

712.23 Flashing Lights Flashing Lights shall be power operated or battery operated as specified.

(a) Power operated flashing lights shall consist of housing, adapters, lamps, sockets, reflectors, lens, hoods and other necessary equipment designed to give clearly visible signal indications within an angle of at least 45 degrees and from 3 to 90 m [10 to 300 ft] under all light and atmospheric conditions.

Two circuit flasher controllers with a two-circuit filter capable of providing alternate flashing operations at the rate of not less than 50 nor more than 60 flashes per minute shall be provided.

The lamps shall be 650 lumens, 120 volt traffic signal lamps with sockets constructed to properly focus and hold the lamp firmly in position.
The housing shall have a rotatable sun visor not less than 175 mm [7 in] in length designed to shield the lens.

Reflectors shall be of such design that light from a properly focused lamp will reflect the light rays parallel. Reflectors shall have a maximum diameter at the point of contact with the lens of approximately 200 mm [8 in].

The lens shall consist of a round one-piece convex amber material which, when mounted, shall have a visible diameter of approximately 200 mm [8 in]. They shall distribute light

and not diffuse it. The distribution of the light shall be asymmetrical in a downward direction. The light distribution of the lens shall not be uniform, but shall consist of a small high intensity portion with narrow distribution for long distance throw and a larger low intensity portion with wide distribution for short distance throw. Lenses shall be marked to indicate the top and bottom of the lens.

(b) Battery operated flashing lights shall be self- illuminated by an electric lamp behind the lens. These lights shall also be externally illuminated by reflex-reflective elements built into the lens to enable it to be seen by reflex-reflection of the light from the headlights of oncoming traffic. The batteries must be entirely enclosed in a case. A locking device must secure the case. The light shall have a flash rate of not less than 50 nor more than 60 flashes per minute from minus 30 °C [minus 20 °F] to plus 65 °C [plus 150 °F]. The light shall have an on time of not less than 10 percent of the flash cycle. The light beam projected upon a surface perpendicular to the axis of the light beam shall produce a lighted rectangular projection whose minimum horizontal dimension shall be 5 degrees each side of the horizontal axis. The effective intensity shall not have an initial value greater than 15.0 candelas or drop below 4.0 candelas during the first 336 hours of continuous flashing. The illuminated lens shall appear to be uniformly bright over its entire illuminated surface when viewed from any point within an angle of 9 degrees each side of the vertical axis and 5 degrees each side of the horizontal axis. The lens shall not be less than 175 mm [7 in] in diameter including a reflex-reflector ring of 13 mm [½ in] minimum width around the periphery. The lens shall be yellow in color and have a minimum relative luminous transmittance of 0.440 with a luminance of 2854° Kelvin. The lens shall be one-piece construction. The lens material shall be plastic and meet the luminous transmission requirements of this specification. The case containing the batteries and circuitry shall be constructed of a material capable of withstanding abuse equal to or greater than 1.21 mm thick steel [No. 18 U.S. Standard Gage Steel]. The housing and the lens frame, if of metal shall be properly cleaned, degreased and pretreated to promote adhesion. It shall be given one or more coats of enamel which, when dry shall completely obscure the metal. The enamel coating shall be of such quality that when the coated case is struck a light blow with a sharp tool, the paint will not chip or crack and if scratched with a knife will not powder. The case shall be so constructed and closed as to exclude moisture that would affect the proper operation of light. The case shall have a weep hole to allow the escape of moisture from condensation. Photoelectric controls, if provided, shall keep the light operating whenever the ambient light falls below 215 lx [20 foot candles]. Each light shall be plainly marked as to the manufacturer's name and model number.

If required by the Resident, certification as to conformance to these specifications shall be furnished based on results of tests made by an independent testing laboratory. All lights are subject to random inspection and testing. All necessary random samples shall be

provided to the Resident upon request without cost to the Department. All such samples shall be returned to the Contractor upon completion of the tests.

712.32 Copper Tubing Copper tubing and fittings shall conform to the requirements of ASTM B88M Type A [ASTM B88, Type K] or better.

712.33 Non-metallic Pipe, Flexible Non-metallic pipe and pipe fittings shall be acceptable flexible pipe manufactured from virgin polyethylene polymer suitable for transmitting liquids intended for human or animal consumption.

712.34 Non-metallic Pipe, Rigid Non-metallic pipe shall be Schedule 40 polyvinylchloride (PVC) that meets the requirement of ASTM D1785. Fittings shall be of the same material.

712.341 Metallic Pipe Metallic pipe shall be ANSI, Standard B36.10, Schedule 40 steel pipe conforming to the requirements of ASTM A53 Types E or S, Grade B. End plates shall be steel conforming to ASTM A36/A36M.

Both the sleeve and end plates shall be hot dip galvanized. Pipe sleeve splices shall be welded splices with full penetration weld before galvanizing.

712.35 Epoxy Resin Epoxy resin for grouting or sealing shall consist of a mineral filled thixotropic, flexible epoxy resin having a pot life of approximately one hour at 10°C [50°F]. The grout shall be an approved product suitable for cementing steel dowels into the preformed holes of curb inlets and adjacent curbing. The sealant shall be an approved product, light gray in color and suitable for coating the surface.

712.36 Bituminous Curb The asphalt cement for bituminous curb shall be of the grade required for the wearing course, or shall be Viscosity Grade AC-20 meeting the current requirements of Subsection 702.01 Asphalt Cement. The aggregate shall conform to the requirements of Subsection 703.07. The coarse aggregate portion retained on the 2.36 mm [No. 8] sieve may be either crushed rock or crushed gravel.

The mineral constituents of the bituminous mixture shall be sized and graded and combined in a composite blend that will produce a stable durable curbing with an acceptable texture.
Bituminous material for curb shall meet the requirements of Section 403 - Hot Bituminous Pavement.

712.37 Precast Concrete Slab Portland cement concrete for precast slabs shall meet the requirements of Section 502 - Structural Concrete, Class A.

The slabs shall be precast to the dimension shown on the plans and cross section and in accordance with the Standard Detail plans for Concrete Sidewalk Slab. The surface shall be

finished with a float finish in accordance with Subsection 502.14(c). Lift devices of sufficient strength to hold the slab while suspended from cables shall be cast into the top or back of the slab.

712.38 Stone Slab Stone slabs shall be of granite from an acceptable source, hard, durable, predominantly gray in color, free from seams which impair the structural integrity and be of smooth splitting character. Natural color variations characteristic of the deposit will be permitted. Exposed surfaces shall be free from drill holes or indications of drill holes. The granite slabs in any one section of backslope must be all the same finish.

The granite slabs shall be scabble dressed or sawed to an approximately true plane having no projections or depressions over 13 mm [½ in] under a 600 mm [2 ft] straightedge or over 25 mm [1 in] under a 1200 mm [4 ft] straightedge. The arris at the intersection of the top surface and exposed front face shall be pitched so that the arris line is uniform throughout the length of the installed slabs. The sides shall be square to the exposed face unless the slabs are to be set on a radius or other special condition which requires that the joints be cut to fit, but in any case shall be so finished that when the stones are placed side by side no space more than 20 mm [3/4 in] shall show in the joint for the full exposed height.

Liftpin holes in all sides will be allowed except on the exposed face.

SPECIAL PROVISION SECTION 717
ROADSIDE IMPROVEMENT MATERIAL

717.05 Mulch Binder. Change the third sentence to read as follows:

"Paper fiber mulch may be used as a binder at the rate of 2.3 kg/unit [5 lb/unit]."

SPECIAL PROVISION
SECTION 304
AGGREGATE BASE AND SUBBASE COURSE
(Aggregate Subbase)

If the Contractor wishes to route public traffic over the completed aggregate subbase course, the course shall be constructed with a minimum 50 mm [2 in] surcharge above the design grade, except as described below. Whenever the surcharge is used, it shall be constructed with material meeting the requirements of Section 703.06(b), Type D Aggregate. Also, whenever, the surcharge is used, it shall be placed on all the aggregate subbase course subjected to public driveways, sidewalks, approach roads, or the outer portions of the shoulders. Removal of the surcharge shall be followed immediately in succession by the fine grading of the aggregate subbase and construction of the next course.

The furnishing, placing, maintaining, and removal of the surcharge will not be paid for directly, but will be considered incidental to the Aggregate Subbase Course pay item.

If salvaged bituminous pavement is placed as the top layer of the aggregate subbase course, a surcharge is not required.

Ellsworth
NH - 7106(00)E
Route 1A
Oak and High Street
Highway Reconstruction
October 19, 2004

SPECIAL PROVISION
SECTION 403
HOT MIX ASPHALT

Desc. of Course	Grad. Design	Item Number	Bit Cont. % of Mix	Total Thick	No. Of Layers	Comp. Notes
			High Street, Oak Street and Main Street Travelway and Curb Offset			
Wearing	12.5mm	403.208	N/A	40mm	1	5,7,14,20
Base	12.5mm	403.213	N/A	40mm	1	5,7,14,20
Base	19.0mm	403.207	N/A	120mm	2/more	5,7,14,15
			East Main Street Travelway, Shoulder, and Curb Offset			
Wearing	12.5mm	403.208	N/A	40mm	1	5,7,14,20
Base	12.5mm	403.213	N/A	40mm	1	5,7,14,20
Base	19.0mm	403.207	N/A	45mm	1/more	5,7,11,14,15
			Side Road Approaches			
Wearing	12.5mm	403.208	N/A	35mm	1	5,7,12
Base	12.5mm	403.213	N/A	40mm	1	5,7
			Sidewalks, Drives & Islands			
Wearing	9.5mm	403.209	N/A	50mm	2/more	2,3,9,10,13

COMPLEMENTARY NOTES

2. The density requirements are waived.
3. The design traffic level for mix placed shall be <0.3 million ESALS.
5. The aggregate qualities shall meet the design traffic level of 3 to <10 million ESALS for mix placed under this contract.
7. Section 106.6 Acceptance, (1) Method A.
9. Section 106.6 Acceptance, (2) Method C.
10. A **"FINE"** 9.5 mm mix with a gradation above or through the restricted zone shall be used for this item.
11. A mixture meeting the gradation of 12.5 mm hot mix asphalt may be used at the option of the contractor.
12. A mixture meeting the gradation of 9.5 mm hot mix asphalt may be used at the option of the contractor.
13. A mixture meeting the requirements of section 703.09 Grading 'D', with a minimum PGAB content of 6%, and the limits of Special Provision 401, Table 9 (Drives and Sidewalks) for PGAB content and gradation may be substituted for this item. A job mix formula shall be submitted to the department for approval.
14. Testing for **shoulders/curb offsets** shall be Method 'A' for volumetrics and density. The density requirements shall be 92.5 to 97.5, or the same as the specified for the travel lane, ramps, and sideroads. The incentive / disincentive for density and volumetrics shall apply.
15. Any base or binder mix left exposed to traffic over the winter shall have a layer of 12.5 mm mix substituted for the 19mm mix. If this substitution is made, the specified layers may need to be modified, as approved by the Resident**.**

20. Due to the low speed and multi-lane, urban conditions of this specific Contract, the Standard Specification Section 401 – subsection 401.15 Spreading and Finishing , paragraph 2, shall be amended with the following option:

The Contractor may place the specified HMA pavement course, not to exceed **1 ½ inch** (**40mm**) compacted depth, over the full single travel lane width, for each production day. If this option is utilized the Contractor will be required to place a matching course of HMA over the adjacent section(s) of travel lane(s) before the end of the following calendar day.

The Contractor will also be responsible for installing additional warning signage that clearly defines the centerline elevation differential hazard, to be approved by the Resident, as well as additional centerline delineation such as double RPM application, or temporary painted line. The Traffic Control Plan shall be amended to include this option and the additional requirements. All signs and traffic control devices will conform to Section 719.01, and Section 652, and will be installed prior to the work, at a maximum spacing of 0.50 mile [0.80 km] for the entire length of the effected roadway section (s). On roadways with two-way traffic, the Contractor will be required to place the specified course over the full width of the mainline traveled way(s) being paved prior to opening the sections to weekend or holiday traffic.

If this option is utilized, all additional signing, labor, traffic control devices, or incidentals will not be paid for directly, but will be considered incidental to the appropriate 652 items.

Tack Coat

A tack coat of emulsified asphalt, RS-1 or HFMS-1, Item #409.15 shall be applied to any existing pavement at a rate of approximately 0.08 L/m², and on milled pavement approximately 0.2 L/m², prior to placing a new course. A fog coat of emulsified asphalt shall be applied between shim / intermediate course and the surface course, at a rate not to exceed 0.08 L/m².

Tack used between layers of pavement will be paid for at the contract unit price for Item 409.15 Bituminous Tack Coat.

Ellsworth
STP-7106(00)X
October 13, 2004

SPECIAL PROVISIONS
SECTION 502
STRUCTURAL CONCRETE
(Roadway Median)

Description. This work shall consist of furnishing and placing a portland cement concrete pavement and incidental construction as shown on the plans and as directed. Except as otherwise specified in this Special Provision, all work shall be in conformity with the applicable provisions of Section 502, Structural Concrete; Section 503, Reinforcing Steel; and Section 515, Protective Coating for Concrete Surfaces.

MATERIALS

Concrete. Concrete shall be Class LP.

Reinforcement. Reinforcement shall be 6"x 6" W4 x W4 Steel Welded Wire Fabric, Deformed, conforming to Section 503 and Section 709.02.

Water Stops. Water stops for joints shall meet the requirements of Section 701.07.

CONSTRUCTION REQUIREMENTS

Preparation of Foundation. The foundation bed shall be well graded and compacted, as directed by the Resident, to provide the thickness of concrete indicated on the plans.

Prior to the concrete placement, the foundation bed shall be thoroughly and uniformly saturated with water. The bed shall be free of puddles and excessive surface water.

Placement of Concrete. Concrete shall be placed in a continuous placement operation when possible so that construction joints will be kept to a minimum. Construction joints shall be constructed when there is a break in a placement. Construction joints shall be brushed with a neat concrete paste immediately prior to making the adjacent placement. Control joints shall be constructed with a water stop placed transversely six meters on center.

The surface of the concrete shall receive a float finish in accordance with Subsection 502.14(A). Immediately following the float finish, the surface shall be textured at right angles to the roadway using an approved open-pile, stiff bristle broom or mat or rigid-tined rake.

The curing period for the concrete shall be seven days and shall meet the requirements of Standard Specifications Section 502.15. The finished surface of the concrete shall receive a protective coating in accordance with Section 515.

Quality Assurance. Quality assurance of Structural Concrete, Roadway Median will be by Method C as defined in Section 502.0504 of the Standard Specifications.

Method of Measurement. Structural Concrete, Roadway Median, satisfactorily placed and accepted, will be measured for payment by the cubic meter, in accordance with the dimensions shown on the plans or authorized by the Resident.

Basis of Payment. The accepted quantity of Structural Concrete, Roadway Median will be paid for at the contract unit price per cubic meter, which payment will be full compensation for all labor, materials, equipment and incidentals necessary to complete the work, including the fabrication, delivery and placement of reinforcement; the furnishing and placement of water stops and joint sealant; and the furnishing and application of protective coating.

Payment will be made under:

Pay Item		Pay Unit
502.341	Structural Concrete, Roadway Median	Cubic Meter

Ellsworth
NH-7106(00)E
March 26, 2004

SPECIAL PROVISION
SECTION 604
MANHOLES AND CATCH BASINS
(Sub-Basin Bowl)

Description Install Sub-Basin Bowl and connect to existing drainage system as shown on the plans and as directed by the Resident.

Materials Materials shall meet the requirements of the Neenah Foundry Company R-3223 series, Cast Iron Sub-Basin Bowls or an approved equal. Pipe to connect the sub-basin bowl to the existing manhole or catch basin shall be PVC sanitary sewer pipe (SDR-35).

Construction Requirements Sub-Basin Bowls shall be placed to the required grade on a compacted foundation of uniform density. Outlet and pipe elevations may vary from the elevations shown on the plans depending upon field conditions.

Pipe sections shall be firmly connected to the sub-basin bowl and the structure wall of the existing catch basin with no part of the pipe projecting more than 150 mm [6 in] inside the wall. New invert connections to the existing manhole or catch basin shall be core cut at the elevation shown on the plans or as determined by the Resident.

Metal frames shall be set in a bed of clay bricks or shale bricks and mortar, or otherwise secured as shown on plans. Castings shall be set to the correct elevation before the final course of paving material has been placed.

Method of Measurement Sub-basin bowls and accessories will be measured by the number of units each, complete and accepted in place.

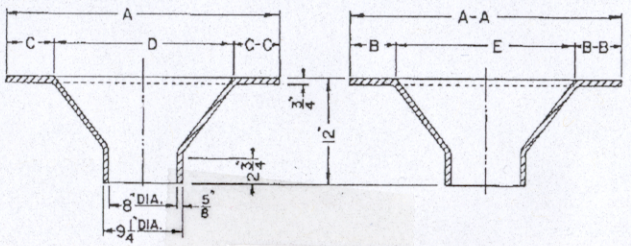
Basis of Payment The accepted quantities of sub-basin bowls will be paid for at the contract unit price each, complete and in place. Payment for installation shall include furnishing all materials including connecting pipe, connectors, bricks and core cutting the existing catch basin. Frames and cascade grates for the sub-basin bowls shall be considered part of the unit and no separate payment will be made. There will be no payment for cleaning new sub-basin bowl installations or the connecting manhole or catch basin. Payment will be full compensation for supplying all equipment and labor to clean sub-basin bowls and dispose of the waste.

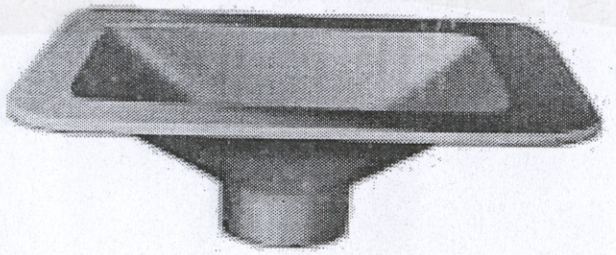
Excavation and backfill will be measured and paid for as provided in section 206 – Structural Excavation.

Pay Item	Pay Unit
604.2404 Sub-Basin Bowl	Each

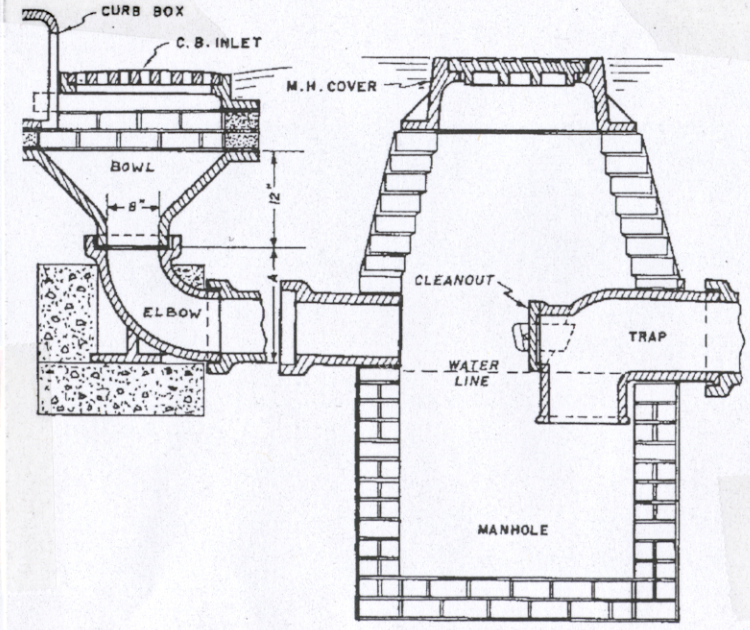
Dimensions in Inches

	A	A-A	B	B-B	C	C-C	D	E
R-3223	37 3/4	35	5 1/4	5 1/4	3 1/2	5 1/4	29	24 1/2
R-3223-A	37	31	5 1/4	5 1/4	5 1/4	5 1/4	26 1/2	20 1/2
R-3223-B	31	31	5 1/4	5 1/4	5 1/4	5 1/4	20 1/2	20 1/2





For pipe or elbow connection.



Ellsworth
NH-7106 (00) E
PIN #7106.00
February 6, 2004

SPECIAL PROVISION
SECTION 608

DETECTABLE WARNINGS
(Masonry Pavers)

Description: This work includes the installation of detectable warnings on concrete and/or asphalt curb ramps at the locations shown in the plans and in accordance with the plans or as established by Project Personnel.

Materials:

General: All base courses and joints shall conform to the applicable subsections of Division 700 of the Standard Specifications.

The Contractor shall provide new, vacuum dry-pressed, bevel-edged and kiln-fired, solid (uncored), hard-burned, frost-free, masonry pavers complying with the requirements of ASTM C902, Class SX, Application PS, with the following modifications:

(a) The maximum absorption limit shall be 8 percent for the average of five bricks.

(b) The minimum compressive strength shall not be less than 8,000 pounds per square inch.

(c) The modulus of rupture shall not be less than 1,000 pounds per square inch.

(d) The bricks shall be No. 1, water struck type for paving.

A. Samples and Submittals:

1. The following list is provided for information only, and does not limit the Contractor to the use of only these suppliers. However, the Contractor shall submit a sample of the product, the name of the selected supplier, and color samples to the Project Personnel for approval prior to start of work.

Vendor Name	Product	Phone Numbers
Whitacre-Greer c/o Brooks Brick Company	Masonry Pavers	(207) 989-3318
Endicott Clay Products	Masonry Pavers	(402) 729-3315

B. Masonry pavers and sand bedding shall conform to the following material requirements:

1. Detectable warnings on curb ramps shall be truncated domes of the dimensions shown in the plans. Domes shall be prefabricated by the manufacturer as a pattern on masonry pavers.
2. Pavers shall meet all Americans with Disabilities Act Accessibility guidelines (ADAAG) requirements for truncated domes, and when installed, shall be capable of producing the pattern of domes as shown in the plans. Pavers shall meet the requirements of ASTM C 902 or ASTM C 936.
3. The domes and the underlying surface shall have a minimum of 70% contrast with the light reflectivity of the adjoining surface as specified under the Americans with Disabilities Act Accessibility Guidelines (ADAAG) requirements for truncated domes.
4. The contrast shall be achieved by adding pigment during the fabrication of the pavers. Prior to start of work, the Contractor shall submit appropriate documentation from the manufacturer verifying that the contrast has been met, along with a sample paver, to the Project Personnel for approval.
5. Bedding and joint sand shall be free of deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Limestone screenings or stone dust shall not be used. Sand for bedding material shall conform to ASTM C 33. Sand that is to be placed between joints shall conform to ASTM C 144.

CONSTRUCTION REQUIREMENTS

General: Pre-fabricated masonry pavers for detectable warnings shall be brought to the site in steel banded, plastic banded or plastic wrapped cubes capable of being transported by a fork lift or clamp lift. Pavers shall be carefully removed and stacked in a manner that results in the least amount of damage. All pavers that are damaged during transport or delivery will be rejected and shall be replaced at the Contractor's expense. Minor cracks or chipping due to transport and handling that do not interfere with the structural integrity of the pavers or the overall pattern of truncated domes will not be deemed as grounds for rejection.

Placing:

A. Sand Setting Bed:

1. The Contractor shall spread the bedding sand evenly in the defined area and shall screed the sand to a depth of ¾ " to 1 ½" over a compacted gravel base.

B. Paver Installation:

1. Pavers shall be placed in a running bond pattern. Domes shall be aligned to create a square grid in the predominant direction of travel as shown in the plans. Pavers shall be installed such that the base of the truncated dome is at the same elevation as the adjoining surface, allowing for a smooth transition between the curb ramp and the detectable warning.

2. When cut pavers are required to fill gaps between the pavers and the edge of concrete, the Contractor shall bevel portions of the truncated domes at a 45-degree angle to create a smooth transition between the partial dome and the curb ramp surface. Unless otherwise directed by the Project Personnel, pavers shall be cut and installed in such a manner that the domes on the cut sections will not significantly impact the overall pattern of the truncated domes.

C. Compaction

1. The Contractors shall use a plate vibrator to embed the pavers into the sand. The size and type of plate vibrator shall be in accordance with manufacturer's recommendations, or as directed by the Project Personnel. All pavers that are damaged during embedment shall be replaced at the Contractor's expense.

2. Joint spacing between paver units shall be in accordance with the manufacturer's recommendations, or as approved by the Project Personnel. Joints shall be filled completely with joint sand. Excess sand shall be removed by sweeping.

Method of Measurement:

Detectable warnings on new curb ramps, including sand, pavers, and all other work and materials necessary for fabrication, transport, and installation will not be measured and paid for separately, but shall be included in the work.

Truncated domes that are installed on existing curb ramps will be measured by the actual number of square meters that are installed and accepted.

Basis of Payment:

Payment will be full compensation for all labor, materials, and equipment required to install the truncated domes including surface preparation and removal/replacement of concrete or asphalt.

Pay Item		**Pay Unit**
608.253	Masonry Paver with Truncated Domes	Square Meter Sq. FT x 0.0929 = Square Meter

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

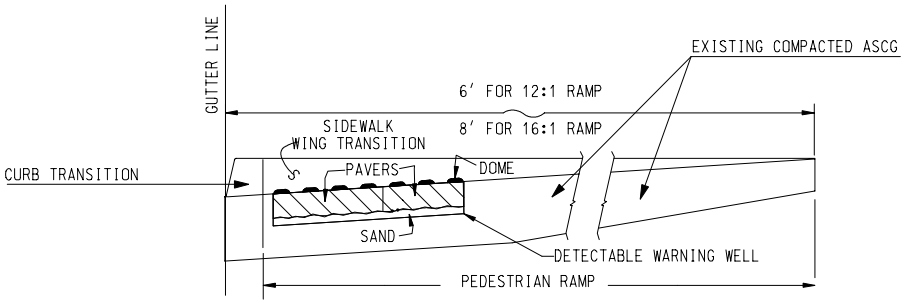
CURB RAMP

DETAILS

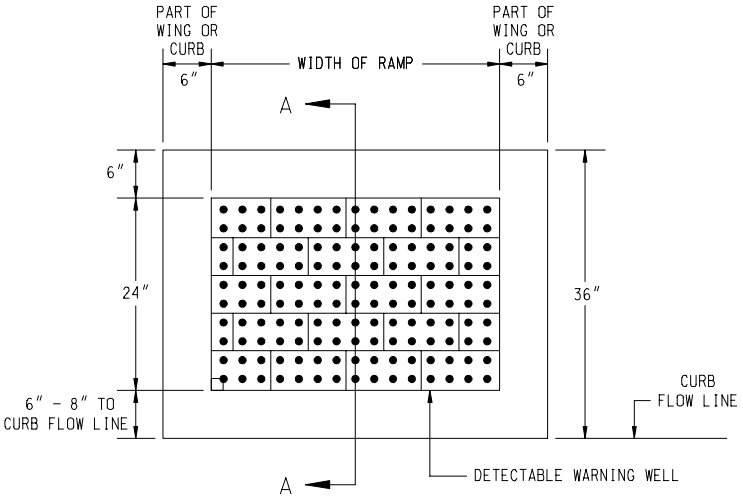
VIEWS AND DETAILS OF THE DETECTABLE WARNING

SHEET NUMBER 1

VIEWS AND DETAILS OF THE DETECTABLE WARNING

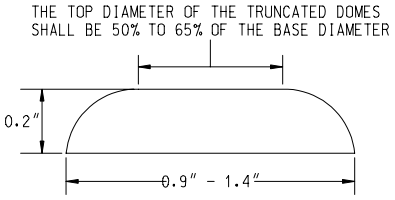


SIDE SECTION VIEW OF
DETECTABLE WARNING, WELL, CURB, AND GUTTER

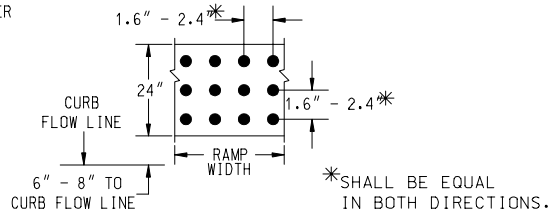


PLAN VIEW OF
DETECTABLE WARNING AND WELL

(PAVERS NOT DRAWN TO SCALE)

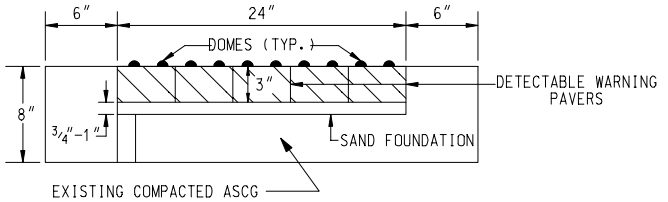


ELEVATION VIEW



PLAN VIEW

DOME AND DETECTABLE WARNING DETAILS



SECTION A-A

NOTE:
ALL DETECTABLE WARNING AREAS SHALL START 6 INCHES FROM THE FLOW LINE OF THE CURB, AND BE 24 INCHES IN DEPTH, AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.

Ellsworth
PIN 3036.20
October 26, 2004
MDOT 621

SPECIAL PROVISIONS
SECTION 621
LANDSCAPE
(Plant Species Specification and Quantities List)

The following list of items provides the estimated quantities for use on this project. The scientific name of the plant material is provided along with the common name in parenthesis.

The contractor shall follow MDOT Standard Specifications Rev. December, 2002 for landscape materials and installation procedures (sec 621).

The WBRC Landscape Architect and/or the MDOT Landscape Architect or other designee will be available to inspect plant materials and stake the location of plant materials at the time of planting.

In accordance with Section 104.5.9, a separate Performance Bond will not be required for the Landscape portion of this contract. A Maintenance Bond for a Two-Year Establishment period in the full value of the planting contract shall be included in this project.

PLANT MATERIALS

ITEM NO	Description	Unit	Quantity	Total
621.202	Small Deciduous Trees 2" – 2 1/2" cal. (50 mm – 65 mm) Group B B&B	Ea.		3
	Amelanchier laevis (Service Berry) Single stem Tree Form		3	
621.273	Large Deciduous Trees 2" – 2 1/2" cal. (50 mm – 65 mm) Group A B&B	Ea.		12
	Acer saccharum 'Legacy' ('Legacy' Sugar Maple)		6	
	Quercus coccinea (Scarlet Oak)		6	
621.540	Deciduous Shrubs 18" – 24" (450 mm - 600 mm) Group A	Ea.		36
	Rosa rugosa 'Alba' (White Beach Rose)		36	
621.710	Herbaceous Perennials Group A 2 qt. Cont.	Ea.		120
	Hemerocallis x. hybrida 'Happy Returns'		120	
621.8	Two-Year Establishment Period	LS		LS
	Two-Year Maintenance Establishment Period		LS	

Ellsworth
PIN 3036.20
October 26, 2004
City Streetscape

SPECIAL PROVISIONS
SECTION 621
LANDSCAPE
(Plant Species Specification and Quantities List)

The following list of items provides the estimated quantities for use on this project. The scientific name of the plant material is provided along with the common name in parenthesis.

The contractor shall follow MDOT Standard Specifications Rev. December, 2002 for landscape materials and installation procedures (sec 621).

The WBRC Landscape Architect and/or the MDOT Landscape Architect or other designee will be available to inspect plant materials and stake the location of plant materials at the time of planting.

In accordance with Section 104.5.9, a separate Performance Bond will not be required for the Landscape portion of this contract. A Maintenance Bond for a Two-Year Establishment period in the full value of the planting contract shall be included in this project.

PLANT MATERIALS

ITEM NO	Description	Unit	Quantity	Total
621.147	Small Deciduous Trees 2 ½" – 3" cal. (65 mm – 75 mm) Group A B&B	Ea.		5
	Amelanchier laevis (Service Berry) Single stem Tree Form		5	
621.279	Large Deciduous Trees 2 ½" – 3" cal. (65 mm – 75 mm) Group A B&B	Ea.		28
	Fraxinus pennsylvanica 'Patmore' (Patmore Ash)		18	
	Gleditsia triacanthos var inermis 'Shademaster' (Shademaster Honeylocust)		10	
621.280	Small Deciduous Trees 2 ½" – 3" cal. (65 mm – 75 mm) Group B B&B	Ea.		35
	Malus 'Red Baron' ('Red Baron' Crabapple)		8	
	Malus 'Spring Snow' ('Spring Snow Crabapple)		19	
	Syringa reticulate 'Ivory Silk'		8	

621.281	Large Deciduous Trees 2 ½" – 3" cal. (65 mm – 75 mm) Group C B&B	Ea.		17
	Ginko biloba PNI 2720 'Princeton Sentry' 'Princeton Sentry' Ginkgo		17	
621.402	Dwarf Evergreens 24" – 30" (600 mm 750 mm) B&B Group A			95
	Juniperus chinensis 'Pfitzeriana compacta' ('Pfitzer Dwarf Juniper)	Ea.	78	
	Juniperus horizontalis 'Bar Harbor' ('Bar Harbor' Creeping Juniper)		17	
621.540	Deciduous Shrubs 18" – 24" (450 mm - 600 mm) Group A	Ea.		69
	Rosa rugosa 'Alba' (White Beach Rose)		9	
	Rosa 'Seafoam White' (Seafoam Shrub Rose)		10	
	Rosa 'Fairy' (Pink Fairy Rose)		50	
621.710	Herbaceous Perennials Group A 2 qt. Cont.	Ea.		983
	Hemerocallis x. hybrida 'Happy Returns'		983	
621.8	Two-Year Establishment Period	LS		LS
	Two-Year Maintenance Establishment Period		LS	

* * *

Ellsworth
STP-7106(00)X
October 13, 2004

SPECIAL PROVISION
SECTION 634
HIGHWAY LIGHTING
(Remove and Reset Light Standard)

Description. This work shall consist of removing existing light standards and resetting at new locations as shown on the plans or directed by the Resident.

MATERIALS

Materials. Materials for removing and resetting light standards shall consist of the existing light standards, ballasts, lamps, luminaires and other necessary hardware of the existing lighting. Materials used for replacement of damaged or lost components shall be of similar materials, dimensions and appearance to the original components and shall otherwise conform to the requirements of Section 634 of the Standard Specifications and Standard Details.

CONSTRUCTION REQUIREMENTS

General. A light standard designated to be removed and reset shall be carefully removed from its present location, temporarily stored, if necessary, and reinstalled at the new location in accordance with the applicable requirements of Section 634 of the Standard Specifications for installation of lighting. Components found to be unfit for reuse prior to or upon removal shall be replaced when directed by the Resident. Any material damaged or lost during removing, storage or resetting shall be replaced by the Contractor without additional compensation.

Method of measurement. Remove and Reset Light Standard will be measured by the unit accepted in place in its relocation.

Basis of Payment. The accepted quantity of Remove and Reset Light Standard will be paid for at the contract unit price each, complete in place at the relocation. Such payment will be full compensation for removing, transporting, storing, reassembling all parts, furnishing of new hardware, conduit and wiring as needed, and all other incidentals necessary to complete the work. Replacement of lost or damaged materials shall be considered incidental to the contract bid price for Remove and Reset Ligh Standard. Payment for a new foundation for a reset light standard will be made under the applicable Section 626 pay item.

Payment will be made under:

Pay Item		Pay Unit
634.208	Remove and Reset Light Standard	Each

January 29, 2004
Supercedes
December 1, 2002

SUPPLEMENTAL SPECIFICATIONS
SECTION 634
HIGHWAY LIGHTING

Under 634.024 Light Standards, add the following to the 3rd paragraph just prior to the last 2 sentences:

"High mast poles" exceeding 50 feet but less than 100 feet in height shall be classified as Fatigue Category II with Fatigue Importance Factors (I_f) of 0.65 for Vortex Shedding and 0.72 for Natural Wind Gusts. "High mast poles" of 100 feet or more in height, shall be classified as Fatigue Category I with Fatigue Importance Factors (I_f) of 1.0 for Vortex Shedding and 1.0 for Natural Wind Gusts.

WD/brdgprgm

SPECIAL PROVISION
SECTION 636

Segmental Retaining Wall - Supplier Design

(FOR TOTAL WALL HEIGHTS GREATER THAN 4 FT)

Description. This work shall consist of supplying material for and constructing a Segmental Retaining Wall (SRW) in accordance with these specifications and in reasonably close conformity with the lines, grades, design,and dimensions shown on the plans.

Alternative wall types may be used if approved by the MaineDOT project geotechnical engineer. Alternative wall types shall meet the requirements of all applicable MaineDOT and AASHTO Standard Specifications and/or Special Provisions.

An SRW system is comprised of the following components:

Foundation - soil mass supporting the SRW.

Leveling Pad - a pad constructed from crushed stone or non-reinforced concrete used to provide a level surface to place segment units.

Segmental Concrete Unit - a pre-cast concrete retaining wall element made from Portland cement, water, and aggregates.

Unit Fill - crushed stone placed within and immediately behind the segmental concrete units for drainage and increased connection strength.

Geosynthetic Reinforcing - a structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement. The geosynthetic reinforcing shall be manufactured by Tensar, Huesker, Strata Systems, Mirafi, or approved equal.

Reinforced Backfill - compacted soil which is placed within the reinforced zone and behind the unit fill as outlined in these specifications and directed by the Resident.

Filter Fabric - drainage geotextile as shown on the plans.

Drainage - shall consist of a perforated or slotted gravity piped system meeting the requirements of 706.06, Corrugated Polyethylene Pipe for Underdrain, installed within the back of the leveling pad with an outlet to existing drainage systems or ditches.

The SRW system used shall be designed by a Professional Engineer registered in the State of Maine. The SRW(s) shall be manufactured and constructed in accordance with these specifications.

The Contractor shall require the design-supplier to provide an on-site, qualified and experienced technical representative to advise the Contractor and the Resident concerning proper installation procedures. The technical representative shall be on-site during initial stages of the installation and thereafter shall remain available for consultation as necessary for the Contractor or as required by the Resident.

Design Requirements. The SRW system shall be designed by a Professional Engineer registered in the State of Maine and shall be subject to review and acceptance by the MaineDOT project geotechnical engineer. The design shall account for all external loads such as sloping backfill, hydrostatic, traffic and seismic. All appurtenances behind, in front of, under, mounted upon or passing through the wall shall be accounted for in the design. The design shall be performed in accordance with the current edition of the AASHTO Standard Specifications for Highway Bridges, Section 5.9, Prefabricated Modular Wall Design, except as required herein.

A. The minimum factors of safety shall be as follows:

1. Overturning	2.0
2. Sliding	1.5
3. Stability of temporary construction slope:	1.2
4. Ultimate bearing capacity:	2.0
5. Reinforcement pullout:	1.5
6. Reinforcement rupture:	1.5
7. Panel connection pullout or rupture:	2.0

B. Differential Settlement. Segmental units must be able to withstand differential settlements within 1% horizontally or vertically.

C. Foundation Soil Parameters. The wall designer shall use the allowable foundation soil bearing capacity as shown on the plans for the specific wall location. The friction angle of the foundation soils shall be assumed to be 30°, unless otherwise noted on the plans.

D. Reinforcement Length. The soil reinforcement length shall be the same length from the bottom to the top of each wall section. The minimum reinforcement length shall be 70% of the wall height, where the wall height is the vertical distance from the top of the leveling pad to the point of intersection where the backfill surface intersects segmental concrete units.

E. For walls greater than 2.4 m (8 ft) high, nominal length reinforcement is required in every course between stability reinforcement to prevent wall face bulging.

F. Leveling Pad Location. The top of the leveling pad shall be designed so that the embedment depth of the SRW is sufficient to maintain stability. The minimum embedment depth of the top of the leveling pad shall be 305 mm (12 inches).

G. Surface Design. The finish grade surface behind the wall shall be designed to prevent surface water from infiltrating behind the wall.

H. Drainage. A system of drainage shall be designed to collect and dispose of water from the base of the unit fill and the backfill. Whenever possible, this drainage system shall outlet directly into the proposed roadway drainage system. The finish grade behind the SRW shall be designed to minimize the infiltration of surface water into the backfill.

Submittals. The Contractor shall supply the following information to the Department for review and approval a minimum of thirty (30) calendar days prior to beginning construction of the wall:

A. The name, address, and telephone number of the individual who will address any questions relating to the submittal package.

B. Certification that the retaining wall system component's meet the requirements of this specification. This includes, but is not limited to, segmental concrete units, geosynthetics, alignment pins, etc.

C. Test results clearly showing the specific segmental unit face stability.

D. All design calculations, assumptions, and equations clearly explained, shown, and referenced. The name and version number of any computer programs used shall also be included.

E. Plans (2 sets) showing all details, dimensions, quantities, and cross-sections necessary to construct the wall shall be based on the MaineDOT wall detail sheet in the project plan set. These fully detailed plans shall be prepared in conformance with subsection 105.7 of the Standard Specifications and shall include, but not be limited to, the following items:

1. An elevation view of the wall which shall indicate:

   a. the elevation at the top of the wall at all horizontal and vertical break points and at least every 20 meters (50 feet) along the wall.
   b. the elevations of and distance to all steps in the leveling pad.
   c. the location of the original and final ground line.
   d. the maximum calculated bearing pressures for each section of the wall where the wall height and loading conditions differ.
   e. the total number of segmental units per row and the equivalent area given in square meters.
   f. a complete summary of all quantities for the segmental units, select fill and any incidental items required.

2. A plan view of the wall which shall indicate:

   a. the offset from the construction centerline to the face of the wall at all changes in horizontal alignment.
   b. the centerline of any drainage structures.
   c. all horizontal and vertical curve data affecting wall construction.
   d. limits of construction including temporary slopes.

3. Any general notes pertaining to design criteria and construction of the wall.

4. All details and dimensions for the geosynthetic reinforcement, leveling pads, drainage system, alignment and connection details.

5. Cross-sections showing the limits of excavation and limits of the unit fill and reinforced backfill.

6. Standard details for the segmental units, caps, and any incidental items necessary.

7. The State of Maine professional engineer's stamp and signature.

MATERIALS

Segmental Concrete Units. This specification covers segmental concrete units for use in the construction of mortarless retaining walls (SRW's). Each manufacturing facility shall provide the Resident with a copy of their quality control plan and procedures, including testing rates and material sources. Each manufacturing facility shall also supply test reports and documentation to verify compliance with this specification.

All Segmental Concrete Units used for construction shall conform to the following requirements:

A. The minimum 28 day compressive strength requirement shall be 34.5 MPa (5000 psi) for any individual unit and 36.5 MPa (5300 psi) for the average of 3 units.

B. Absorption - 5 percent maximum

C. Unit Weight - 43 kg (95 pounds) per unit, minimum

D. Unit Depth - 455 mm (18 inches), minimum

E. Unit Width - 455 mm (18 inches), minimum at the face

F. Unit Height - 150 mm (6 inches), minimum at the face

G. Wall Thickness - for hollow units, the minimum wall thickness shall be 32 mm (1.25 inches)

H. Tolerances - formed dimensions shall not vary more than 2 mm (1/16 inch) from the manufacturers published dimensions

I. Face Texture - split or smooth face

J. Face Geometry – straight or beveled.

K. Batter - between 0° to 11° from vertical.

L. Alignment and grid positioning mechanism - pins required to align the SRW and provide a shear connection shall consist of a non-degrading polymer or galvanized steel and made for the express use with the SRW units supplied. All shear connections shall be capable of holding the geosynthetic in the proper design position during grid pre-tensioning and backfilling. Other alignment methods consisting of concrete shear keys, concrete shear lips, or other shear connectors as approved, shall be followed in strict conformance with the manufacturer's recommendations.

M. Color - pigment shall be added during the casting process of the segmental unit to achieve a consistent shade of gray or other color as determined by the Resident or as specified on the plans.

N. Imperfections and Rejection - All units shall be sound and free of cracks or other defects that would interfere with the proper placing of each unit or significantly impair the strength or performance of the construction. Minor cracks (e.g. no greater than 0.5 mm (0.02 inches) in width and no longer than 25% of the unit height) incidental to the method of manufacture or minor chipping resultant from shipment and delivery, are not grounds for rejection.

Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 3 meters (10 feet) under diffused lighting.

Rejection - blocks shall be rejected because of failure to meet any of the requirements of this Section. In addition, any or all of the following defects shall be sufficient cause for rejection.
- Defects that indicate imperfect molding.
- Defects indicating honeycomb or open texture concrete.
- Cracked or severely chipped blocks.
- Color variation on front face of block due to excess form oil or other reasons.

O. Cap Units - Cap units must meet the segmental concrete unit manufacturer's size requirements (typically a minimum of one-half the segmental concrete unit depth dimension). Cap units shall be cast to or attached to the SRW units in strict accordance with the manufacturer's requirements and the adhesive manufacturer's recommended procedures.

P. Freeze-Thaw Durability - the freeze-thaw durability of the segmental concrete units tested in accordance with ASTM C 1262 in a 3% saline solution shall be the minimum of the following:

1. The weight loss of each of five test specimens at the conclusion of 90 cycles shall not exceed 1% of its initial weight; or
2. The weight loss of 4 out of 5 test specimens at the conclusion of 100 cycles shall not exceed 1.5% of its initial weight, with the maximum allowable weight loss for the 5th specimen not to exceed 10%.

Q. Cap units shall meet the requirements of (A), (B), and (P) and have a top surface sloped at a minimum of 1 mm fall per 10 mm run (1 inch fall per 10 inches run) front to back or be crowned at the center.

R. ASTM C 1262 test results shall be recorded and reported in 10 cycle intervals.

S. Other Constituents - air entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents shall be previously established as suitable for use in segmental concrete retaining wall units and shall conform to applicable AASHTO standards or, shall be shown by test or experience to be not detrimental to the appearance or durability of the segmental concrete units or any material customarily used in retaining wall construction.

T. Surface Sealant - The surface sealant shall be a water base or solvent based silane or siloxane product.

The surface sealant shall be provided by one of the following approved segmental unit manufacturers. Alternative sealants may be used if approved by the Resident.

Approved Sealants
Sure Klean Weather Seal SL100
ProSoCo, Inc.
3741 Greenway Circle
Kansas City, KA 66117
800-255-4255

Hydrozo Enviroseal 40
ChemRex
889 Valley Park Drive
Shakopee, MN 55379
800-243-6739

Chem-Trete BSM 40 VOC
Sivento, Inc.
2 Turner Place
Piscataway, NJ 08855
877-748-3686

Segmental Concrete Unit Sampling and Testing. Shall conform to ASTM C 140, except that:

Section 6.2.4 shall be deleted and replaced with: "The specimens shall be coupons cut from a face shell of each unit and sawn to remove any face shell projections. The coupon size shall have a height to thickness ratio of 2 to 1 before capping and a length to thickness ratio of 4 to 1. The coupon shall be cut from the unit such that the coupon height dimension is in the same direction as the unit height dimension. Compressive testing of full size units will not be permitted. The compressive strength of the coupon shall be assumed to represent the net area compressive strength of the whole unit."

Cap units and wall units shall be sampled and tested as separate block types.

Each manufacturing facility is required to sample and test each block type at the rate of one sample per 2000 units of continuous production or fraction thereof (if production is interrupted) as part of their overall quality control testing.

> Example: If 5,000 wall units are produced in a continuous production run, 3 sets of samples would be required. If 3,000 units are produced in each of two separate production runs (6,000 total), then 2 sets of samples would be required from each separate production run (4 sets of samples total).

Each manufacturer test set shall include 8 randomly selected wall and cap units for the following testing:

A. Compressive strength (average of 3 units)
B. 24 hour absorption (this is strictly a quality control test)
C. Freeze-thaw durability (average of 5 units)

All block manufacturers shall submit test results from the tests described in the "Segmental Concrete Units" and "Sampling and Testing" sections above to the Resident. All segmental concrete units submitted for use on MDOT or Federal-Aid projects shall be accompanied by a certificate of compliance attached to each pallet of units. The certificate of compliance shall include the name and address of the manufacturing facility and date of manufacture in addition to all other required information.

Segmental Concrete Step Units. Segmental Concrete Step Units shall be supplied by the same supplier as the Segmental Concrete Units and shall conform to Sections A, B, G, H, L, M, N, O, P, and Q for Segmental Concrete Units, as discussed above.

Geosynthetic Reinforcing. The structural geosynthetic reinforcing shall meet the following requirements:

A. The geosynthetics shall be a regular polymeric grid structure of select high density polyethylene (HDPE), polypropylene (PP), or polyester (PET) resin manufactured by Tensar, Huesker, Strata Systems, Mirafi, or approved equal.

B. The geosynthetic shall conform to the following criteria:
   - B1. PP and HDPE: Minimum retained strength of 70 % after 150 hours, per ASTM D-4355.
   - B2. HDPE: Grade = E-4, E-5, E-8, E-9, E-10, E-11, J-3, J-4, J-5, P-24, or P-34, per ASTM D-1248.
   - B3. PET: Molecular weight (Mn) > 25,000 g/mole, Inherent Viscosity Method per ASTM D-4603, with Correlation or Determined Directly Using Gel Permeation Chromatography.
   - B4. PET: Carboxyl end group (CEG) < 30 meg/kg, GRI:GG7
   - B5. All polymers: Minimum Weight per Unit Area of 270 g/m^2, per ASTM D-5261
   - B6. A default total reduction factor for creep, durability, and installation damage of 7 may be used in design, provided the criteria of B2 through B5 and B1 is adjusted to 70% after 500 hours is satisfied.

C. The Long Term Tensile Strength (T_{al}) of the geosynthetic shall be determined by reducing the Ultimate Strength (T_u), as determined using ASTM 4595 or GRI:GG1, by the product of the

reduction factors for durability, installation damage, and creep, denoted RF_D, RF_{ID}, and, RF_{CR}, respectively. The required tests used to determine the reduction factors, minimum value to be used in design if test value is less than minimum, and maximum value to be used in design in the absence of test data are summarized below.

Reduction Factor	Test	Minimum/Maximum
Durability (RF_D)	HDPE and PP: ASTM D4355 PET: GRI:GG7	1.1/2.0
Installation Damage(RF_{ID})	Site installation damaged tests, similar to ASTM D-5818	1.1/3.0
Creep(RF_{CR})	ASTM D-5262	HDPE = 2.6/5.0 PP = 4.0/5.0 PET = 1.6/2.5

D. The pullout resistance factors, F* and α, used in pullout design, shall be determined for the proposed reinforcement and wall system, with soil similar to the specified backfill material of this Section. The pullout resistance factors shall be determined in accordance with Appendix A of FHWA SA-96-071 "Mechanical Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines." In the absence of test data, empirical relationships may be used to determine the pullout resistance factors, any empirical relationships used in design shall be referenced in the design calculations.

E. Long-term connection strength between the geosynthetic reinforcement and the modular blocks shall be checked, per AASHTO-Standard Specifications for Highway Bridges, Section 5.8.

F. The Contractor shall submit a Manufacturer's Certificate, which shall state that the furnished geosynthetic(s) meets the requirements of this Section, as evaluated by the manufacturer's quality control program. Included with the certificates, shall be the design parameters and required properties referenced in this Section. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over validity of values, the Resident can require the Contractor to supply test data from a Department approved laboratory to support the certified values submitted.

Leveling Pad. The leveling pad material shall consist of a non-reinforced concrete and/or compacted crushed stone as shown on the plans. Crushed stone material must conform to Section 703.22, Underdrain Backfill Material, Type C, and non-reinforced concrete must have a minimum 28-day compressive strength of 20685 kPa (3000 psi). At their own risk, the contractor may place segmental units on the concrete leveling pad after the concrete has cured for a minimum of 12 hours.

Unit Fill. Unit fill shall consist of Underdrain Backfill Material Type C, 703.22. Unit fill shall be used in all voids in the segmental units and for a minimum distance of 0.3 meters (1 foot) from the back of the segmental units.

Reinforced Backfill. Backfill shall Consist of Granular Borrow, 703.19 Material for Embankment Construction, with the following restrictions:

A. The maximum size shall not exceed 20 mm (3/4 in.). The maximum aggregate size may be increased to a maximum of 76 mm (3 in.), provided installation damage tests are conducted with similar material, in accordance with ASTM D-5818.
B. Plasticity Index (PI) < 6, per AASHTO T-90.
C. Coefficient of Uniformity (C_u) > 4.
D. Internal friction angle (Φ) = 34°, per AASHTO T-236. The internal friction angle shall be determined on the portion finer than the No. 10 sieve (by weight), using material compacted to

95% of the maximum dry density, per AASHTO T-99, Methods C or D (with oversized correction as outlined in Note 7 at optimum moisture content)

E. pH: between 4.5 and 9 (AASHTO T-289-91)

F. Organic content < 1% (AASHTO T-267-86)

The Contractor is responsible for removing any stones that exceed the maximum size. High plastic clays or organic soils encountered during SRW installation shall be removed and replaced, as directed by the Resident.

Foundation. The foundation shall have sufficient strength to maintain global stability of the SRW.

A. If approved by the project geotechnical engineer, the in situ soils may be used.

B. If the SRW is to be founded on fill, it shall consist of 703.20 Gravel Borrow. The foundation shall be compacted to 95% of the maximum density as determined by AASHTO T-180, Method C or D. The moisture content of the foundation material prior to and during compaction shall be uniformly distributed throughout each layer and shall be within 2 percentage points dry of optimum.

Filter Fabric. - shall be a geotextile meeting the requirements of the MaineDOT Standard Specifications Subsection 722.02, Drainage Geotextile.

Acceptance of Material. The Contractor shall furnish to the Resident a Certificate Of Compliance, certifying that the materials to be used in construction of the SRW, comply with the material requirements of this Section. A copy of all test results performed by the Contractor necessary to assure contract compliance shall be furnished to the Resident. Acceptance will be based on the certificate of compliance, accompany test reports, and visual inspection by the Resident, or tests performed independently by the Resident.

CONSTRUCTION

Construction. Construction practices for the SRW shall be in general conformance with the AASHTO Standard Specifications for Highway Bridges, except as amended herein. All applicable manufacturer's recommendations regarding stability of the SRW during construction shall be followed.

Delivery, Storage and Handling.

A. Segmental concrete units shall be delivered on sealed pallets. Contractor shall check all materials (segmental concrete units, geosynthetics, etc.) upon delivery to assure that the proper materials have been received. A product certification shall be provided with each shipment.

B. Geosynthetic material shall be stored above -20º F

C. Contractor shall prevent excessive mud, wet cement, epoxy and like substances which may affix themselves to the material from coming in contact with the segmental concrete unit and geosynthetic material.

D. Geosynthetic material may be laid flat and stored outside for 30 days. For extended storage, material shall be stored in or beneath a trailer or covered with a colored tarpaulin to prevent long-term exposure. PP and HDPE geosynthetics shall be covered at all times to protect them from UV light and shall only be uncovered just prior to installation. PP and HDPE shall be left unprotected from UV light for a maximum of 24 hours.

Excavation.

A. The Contractor shall excavate to the lines and grades shown on the plans. The Resident will inspect the excavation prior to placement of foundation material.

B. Excavation shall be deep enough to provide a minimum embedment depth of 305 mm (12 inches) to the bottom of the SRW (top of the leveling pad) and a 155-mm (6 inch) thick leveling pad, or as otherwise shown on the plans.

C. The Contractor shall be careful not to disturb the base beyond the leveling pad lines. The Resident will inspect the excavation prior to placement of leveling pad material.

Foundation.

A. Foundation soil shall be brought to grade as required for footing or base dimensions shown on plans, or as directed by the Resident.

B. The foundation soil shall be examined by the project geotechnical engineer to ensure that the actual foundation strength meets or exceeds requirements. Soil not meeting the required strength shall be removed and replaced with acceptable material. Prior to wall erection, the foundation shall be compacted with a smooth drum vibratory roller, or a vibratory plate compactor if access is limited, to provide a strong uniform foundation material. Any foundation soils found to be unsuitable, as determined by the Engineer, shall be removed and replaced with 703.20 Gravel Borrow. The foundation shall be compacted to 95% of the maximum density as determined by AASHTO T-180, Method C or D.

Leveling Pad.

A. Leveling pad shall be placed to the lines and grades as shown on the plans, to a minimum thickness of 155 mm (6 inches) and minimum width of 815 mm (32 inches). Concrete leveling pads shall be a minimum of 100 mm (4 inches) wider than the segmental concrete unit depth dimension to provide 50 mm (2 inches) centering clearance on the front and back of the segmental unit. Concrete leveling pads may also require a 703.22, Type C crushed stone base as shown on the plans or directed by the Resident.

B. Leveling pad material shall be compacted so as to provide a level, hard surface on which to place the first course of segmental concrete units. Compaction shall consist of a minimum of three passes with a large vibratory plate compactor. When concrete is used for the leveling pad, the concrete shall be cured for a minimum of 12 hours before placement of segmental units.

C. Leveling pad shall be prepared to insure full contact with the base surface of the SRW units.

D. Steps in the leveling pad shall not vary from the height of the segmental concrete unit by more than 2 mm (1/16 inch).

E. Contractor shall install a perforated or slotted gravity piped system meeting the requirements of 706.06 Corrugated Polyethylene Pipe for Underdrain within the back of the leveling pad with an outlet to existing drainage systems or ditches.

Segmental Unit Installation.

A. The first course of segmental concrete units shall be placed on the leveling pad, and alignment and level checked. All units shall sit firmly and completely on the pad. Horizontal alignment of

the concrete units shall be controlled from formed edges only. The top of all units on the leveling pad shall be at the same elevation.

B. Each course of segmental concrete units shall be placed side by side the full length of wall alignment.

C. Fill all voids in and between segmental units with unit fill.

D. Remove all excess material from the top of units before installing next course.

E. Maximum stacked vertical height of wall units, prior to unit fill and backfill placement and compaction, shall not exceed one course.

F. All units, whole or split, shall be erected with running bond approximately centered on units above and below.

G. Cap units shall be cast to or attached to the top course of the SRW units in strict accordance with the manufacturer's requirements and the adhesive manufacturer's recommended procedures.

H. All exposed edges of the finished wall shall have either a split face or straight and smooth concrete appearance.

I. The maximum horizontal gap between erected units shall be 3 mm (1/8 inch).

J. Differential settlement and alignment tolerances shall not exceed 1% horizontally or vertically.

Structural Geosynthetic Installation.

A. Geosynthetic shall be oriented with the highest strength axis perpendicular to the wall alignment.

B. Geosynthetic reinforcement shall be placed at the elevations and to the extent required on the plans.

C. The geosynthetic shall be laid horizontally on compacted backfill. The next course of segmental concrete units shall be placed over the geosynthetic. The geosynthetic shall be pulled taut, and anchored prior to backfill placement on the geosynthetic.

D. Geosynthetic reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces of geosynthetic is not allowed.

Reinforced Backfill Placement.

A. Backfill shall be placed, spread, and compacted from the back of the unit fill toward the limits of the excavation to minimize slack. At no time shall backfill be dumped directly onto the geosynthetic. Backfill shall either the dumped adjacent to, or on top of a previously compacted lift of backfill and pushed onto the geosynthetic.

B. Backfill placement shall closely follow erection of each course of blocks. Backfill shall be placed in such a manner as to avoid any damage or disturbance of the wall materials or misalignment of the segmental concrete units.

C. Reinforced backfill shall be placed and compacted in lifts not to exceed 200 mm (8 inches) where lightweight hand-operated compaction equipment is used, or 305 mm (12 inches) where

heavy compaction equipment is used. Heavy compaction equipment shall not be allowed within 1.5 meters (5 feet) from the back of the segmental concrete units.

D. Reinforced backfill placed behind the segmental concrete units shall be compacted to 95% of the maximum density as determined by AASHTO T-99, Method C or D.

E. A minimum compacted lift thickness of 203 mm (8 inches) is required prior to operating any tracked equipment over the geosynthetic. Tracked vehicle turning shall be kept to a minimum to prevent tracks from displacing the fill and damaging the geosynthetic. At no time shall track mounted equipment be allowed directly onto geosynthetic.

F. A minimum compacted lift thickness of 305 mm (12 inches) is required prior to operating any wheel mounted equipment over the geosynthetic. Wheeled vehicle turning shall be kept to a minimum to prevent displacement of the fill and damaging the geosynthetic. When absolutely necessary, as approved by the Resident, rubber tired equipment may pass over the geosynthetic reinforcement at slow speeds less than 16 km/hr(10 MPH). Sudden braking and sharp turning shall be avoided.

G. At the end of each day's operation, the Contractor shall slope the reinforced backfill away from the wall units to direct runoff away from the wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Surface Sealant. Segmental block retaining wall surface sealing shall consist of preparation, furnishing, and applying the surface sealer to the exposed front face and top of the wall.

The contractor must comply with the manufacturer's written instructions for preparing, handling and applying the surface sealant. The surface area to be sealed must be free of all dust, debris, and frost. Surface sealers must be applied at the heaviest application rate specified by the manufacturer.

All materials and work performed as specified above will be incidental to the construction of the wall.

Measurement. Segmental Retaining Wall will be measured by the square meter (square foot) of front surface not to exceed the dimensions shown on the plans or as authorized by the Resident. Vertical dimension limits will be from the top of the leveling pad to the top of the wall. Horizontal dimension limits will be from the edges of the facing units at each end of the wall. Segmental units used behind the face units for the construction of steps will not be paid for separately but will be considered incidental to the Segmental Retaining Wall item.

Basis of Payment. The accepted quantity of Segmental Retaining Wall will be paid for at the contract unit price per square meter (square foot), complete, cleaned of debris and accepted in place. The unit price shall be full compensation for excavation, backfill, and grading beyond the face of the wall and furnishing all materials, labor, equipment, and other incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
636.64 Segmental Retaining Wall Supplier Design	Square meter (Square Foot)

January 29, 2004
Supercedes
December 1, 2002

SUPPLEMENTAL SPECIFICATION
SECTION 643
TRAFFIC SIGNALS

Under 643.023 Design and Fabrication, add the following to the end of the first paragraph:

Cantilevered signal support structures with mast arms shall be classified as Fatigue Category III with Fatigue Importance Factors (I_f) of 0.59 for Natural Wind Gusts and 0.68 for Truck-Induced Gusts unless specified otherwise on the contract plans.

If Category II is specified on the contract plans, the Fatigue Importance Factors (I_f) shall be 0.80 for Natural Wind Gusts and 0.84 for Truck-Induced Gusts. If Category I is specified on the contract plans, the Fatigue Importance Factors (I_f) shall be 1.0 for Natural Wind Gusts and 1.0 for Truck-Induced Gusts.

Designing for fatigue induced by Galloping or Vortex Shedding is not required for traffic signal structures with mast or bracket arms.

WD/brdgprgm

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC

652.6 Night Work. This Subsection is revised with the addition of the following :

The lighting plan shall include :

Descriptions and sketches of the layout of light towers, including spacing, luminary height, lateral placement and anticipated illuminance provided.

Photometric and physical specifications of all lighting equipment.

Detailed description of all lighting to be used on construction equipment.

Methods to be employed to reduce glare.

Contractor's frequency and procedure for checking illumination levels.

Flashing light units shall have red and white reflective tape applied to all sides of the unit such that it defines the outline of the unit.

A traffic control trial shall be carried out for inspection by the Contractor and the Resident. The trial shall involve setup and operation of the full traffic control system and work area light system. No work shall commence until approval is given by the Department to proceed.

February 27, 2003
Supersedes December 10, 2002

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC

Approaches Approach signing shall include the following signs as a minimum. Field conditions may warrant the use of additional signs as determined by the Resident.

Road Work Next x Miles
Road Work 500 Feet
End Road Work

Work Area At each work site, signs and channelizing devices shall be used as directed by the Resident. Signs include:

Road Work xxxx[1]
One Lane Road Ahead
Flagger Sign

Other typical signs include:

Be Prepared to Stop
Low Shoulder
Bump
Pavement Ends

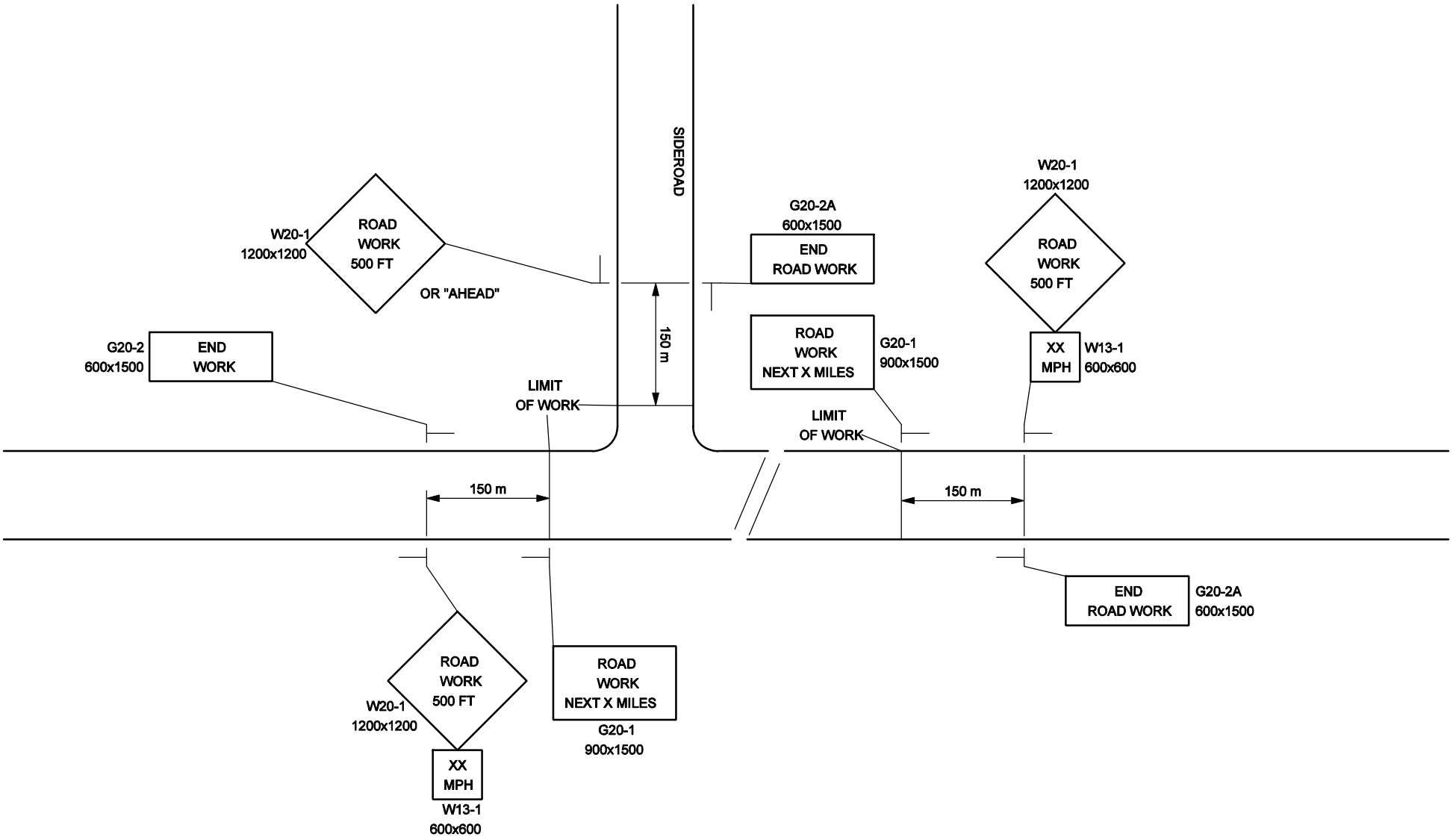
The above lists of Approach signs and Work Area signs are representative of the contract requirements. Other sign legends may be required.

The Contractor shall conduct their operations in such a manner that the roadway will not be restricted to one lane for more than 800 m [2,500 ft] at each work area. Where more than one work area restricts traffic to one lane operation, these work areas shall be separated by at least 1.6 km [1 mile] of two way operation.

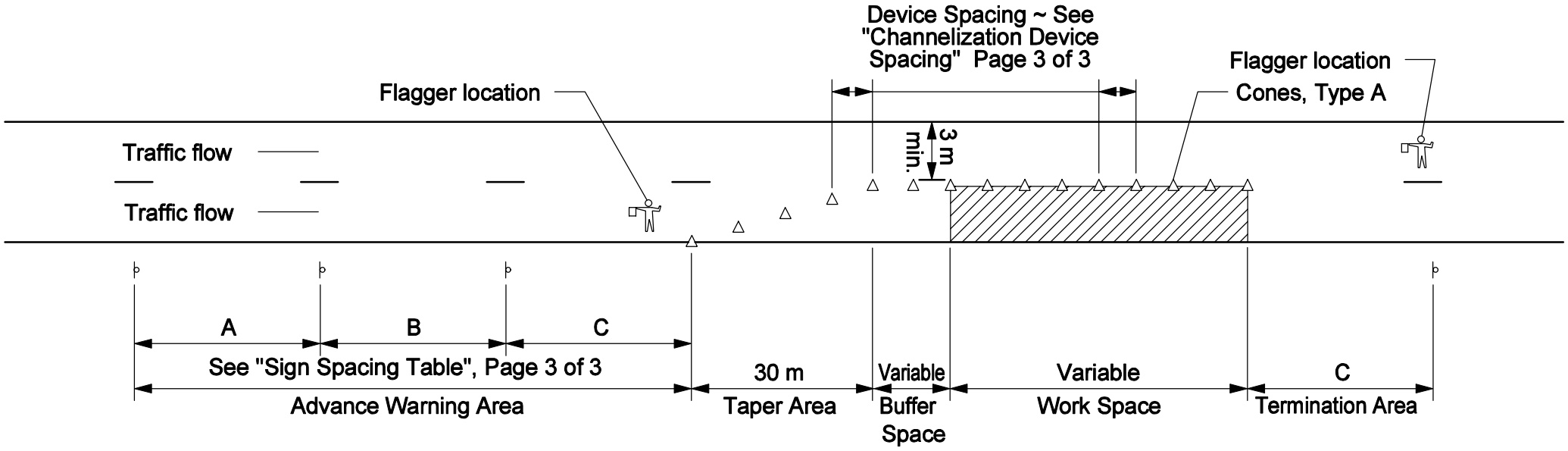
Temporary Centerline A temporary centerline shall be placed each day on all new pavement to be used by traffic. The temporary centerline, when specified of reflectorized traffic paint, shall conform to the standard marking patterns used for permanent markings.

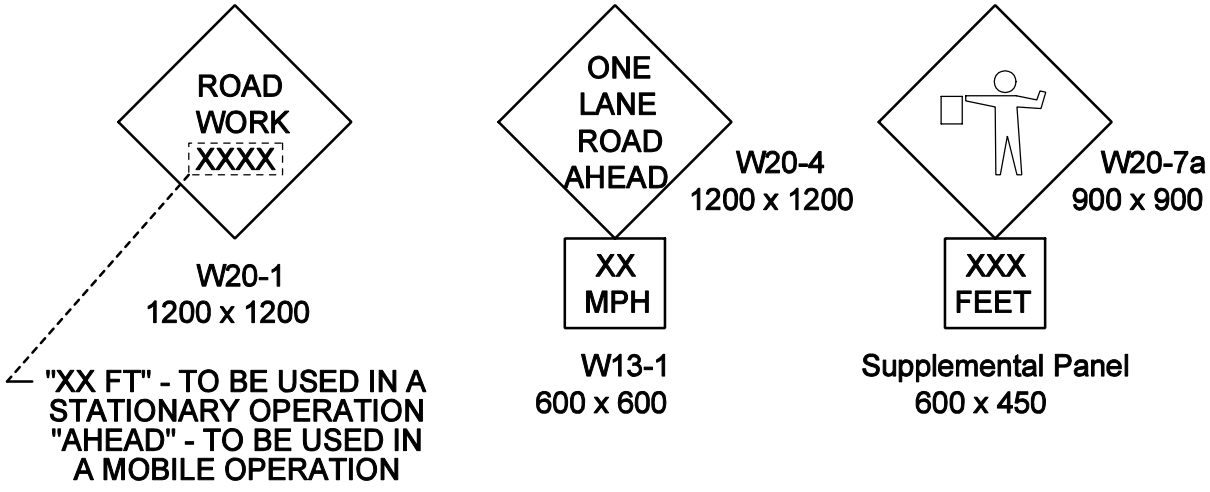
Failure to apply a temporary centerline daily will result in suspension of paving until temporary markers are applied to all previously placed pavement.

[1] "Road Work Ahead" to be used in mobile operations and "Road Work xx ft" to be used in stationary operations as directed by the Resident.



TYPICAL
-- PROJECT APPROACH SIGNING --
TWO WAY TRAFFIC





TYPICAL APPLICATION: TWO - WAY, TWO LANE ROADWAY, CLOSING ONE LANE USING FLAGGERS

TYPE OF TAPER	TAPER LENGTH (L)*
Merging Taper	at least L
Shifting Taper	at least 0.5L
Shoulder Taper	at least 0.33L
One-Lane, Two-Way Traffic Taper	100 ft (30 m) maximum
Downstream Taper	100 ft (30 m) per lane

* Formulas for L are as follows:

For speed limits of 40 mph (60 km/h) or less:

$L = \frac{WS^2}{60}$ $\quad (L = \frac{WS^2}{155})$

For speed limits of 45 mph (70 km/h) or greater:

$L = WS$ $\quad (L = \frac{WS}{1.6})$

* Formulas for L are as follows:

A minimum of 5 channelization devices shall be used in the taper.

CHANNELIZATION DEVICE SPACING

The spacing of channelization devices shall not exceed a distance equal to 1.0 times the speed limit in mph when used for taper channelization, and a distance in feet of 2.0 times the speed limit in mph when used for tangent channelization.

SIGN SPACING TABLE			
Road Type	Distance Between Signs**		
	A	B	C
Urban 30 mph (50 km/h) or less	100 (30)	100 (30)	100 (30)
Urban 35 mph (55 km/h) and greater	350 (100)	350 (100)	350 (100)
Rural	500 (150)	500 (150)	500 (150)
Expressway / Urban Parkway	2,640 (800)	1,500 (450)	1000 (300)

**Distances are shown in feet (meters).

GENERAL NOTES;

1. Final placement of signs and devices may be changed to fit field conditions as approved by the Resident.

SUGGESTED BUFFER ZONE LENGTHS

Speed (mph)	Length (feet)	Speed (mph)	Length (feet)
20	115	40	325
25	155	45	360
30	200	50	425
35	250	55	495

January 3, 2003

SPECIAL PROVISION
SECTION 812
SEWER MANHOLE

Description This work shall consist of the installation and adjustment of manholes as indicated in the Bid Book, Plans, or as directed by the Resident.

Sewer Manhole shall consist of removing an existing manhole and replacing with a new manhole in accordance with Section 604 - Manholes, Inlets, and Catch Basins.

Adjust Sewer Manhole to Grade shall consist of adjusting a manhole to the required final grade, including any lowering and any other adjustments that may be necessary prior to setting the final grade and in accordance with this Section and Section 604 - Manholes, Inlets, and Catch Basins.

Rebuild Sewer Manhole shall consist of rebuilding and adjusting a sewer manhole in accordance with this Section and Section 604 - Manholes, Inlets, and Catch Basins

Pay Item		Pay Unit
812.06	Sewer Manhole	Each
812.162	Adjust Sewer Manhole to Grade	Each
812.164	Rebuild Sewer Manhole	Each

SECTION 02665 - WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: Water distribution piping includes:

A. Supply and installation of all distribution piping as noted on the Drawings.

B. Location of existing utilities prior to construction.

C. Repair of water piping damaged during construction.

D. Supply and installation of all valving, and accessories.

E. Supply and installation of new hydrants, as noted on the Drawings.

F. Flushing, testing and disinfection.

G. Supply and installation of temporary water where noted and required to ensure uninterrupted service.

1.02 RELATED WORK:

A. Section 02200 – Earthwork.

1.03 QUALITY ASSURANCE:

A. Code Compliance: Comply with State Plumbing Code and local plumbing codes where more stringent. Comply with Maine Department of Human Services, Division of Health Engineering rules.

B. AWWA Standards: Comply with requirements of Section 4 of AWWA C601, "Preventive Measures During Construction" for cleanliness.

C. Testing: CONTRACTOR shall pay for all flushing, pressure and leakage testing, disinfection, and fire flow testing.

1.04 SUBMITTALS: Submit manufacturer's product data and installation instructions for each product specified for water service piping.

PART 2 - PRODUCTS

2.01 PRESSURE PIPE:

A. General: Provide fittings and other required piping accessories of same type and class of material as conduit, or of material having equal or superior physical and chemical properties.

B. Copper Tube: Type K conforming to ASTM B88, with compression fittings conforming to ANSI/AWWA C800 as manufactured by Mueller or equal approved by OWNER.

C. Ductile Iron Pipe: Push-on joints, AWWA C111, unless indicated otherwise, centrifugally cast bituminous-coated, double cement-lined (AWWA C104), seal-coated and manufactured in accordance with the latest revision of AWWA Standards C150 and C151. Pipe shall be Class 52 for all piping unless indicated otherwise. Weight, class, manufacturer's mark, year of production, and "DI" or "Ductile" shall be cast or stamped on the pipe. Only 5% of the pipe may be less than the standard manufacturer's length.

D. HDPE Pipe: High Density Polyethylene Pipe meeting AWWA C906 equal to Bluestripe NSF by Plexco shall be used for temporary water. Material shall be PE 3408 HDPE. Provide transition couplings and stiffeners as recommended by pipe manufactures.

E. Pipe Couplings: Sleeve shall be ductile iron ASTM A536, and shall have smooth inside taper for uniform gasket seating. Gasket shall be grade 30. Follower flanges shall be ductile cast iron ASTM A536. Bolts shall be high strength low alloy steel with heavy, semi-finished hexagon nuts to ANSI/AWWA C111/A21.11 standards. OD range shall be approved by the Ellsworth Water Department. Ford coupling, Smith-Blair coupling, or equal approved by OWNER.

F. Pipe Fittings: Pipe fittings shall have mechanical joint ends conforming to ANSI/AWWA C1/A21.11, double cement lining and bituminous coating conforming to ANSI/AWWA C104.A21.4 or fusion bonded epoxy coat (6-8 mil nominal thickness) conforming to ANSI/AWWA C550 & C116/A21.16.

Fittings shall be supplied with mechanical joint accessories unless specified others, with high strength low alloy steel bolts and heavy hexagon nuts conforming to ANSI/AWWA C111.A21.11.

Long body fittings shall be Class 350 ductile iron conforming to ANSI/AWWA C110/A21.10.

Fittings conforming to ANSI/AWWA C153/A21.53 will not be allowed.

G. Repair Sleeves (for Repair of Existing Mains): Shall have single band of 304 stainless steel with malleable iron ASTM A47 grade 32510 lungs, grade 30 gasket and high strength low alloy steel bolts with heavy semi-finished hexagon nuts conforming to AWWA/ANSI C111.A.21.11 or 3904 stainless steel bolts and nuts as manufactured by Smith-Blair 226 or approved equal.

2.02 VALVES, FITTING, CLAMPS, ETC.:

A. General: All products used in the construction that come in contact with drinking water shall meet the National Sanitation Foundation Standard 61 for Drinking Water System Components - Health Effects. The products and/or materials covered include, but are not limited to, protective materials (coatings, linings, liners, etc.), joining and sealing materials (solvent cements, welding materials, gaskets, etc.), and mechanical devices used in transmission/distribution systems, (valves, etc.).

Miscellaneous brass goods shall be 57 Kg., red brass with iron pipe threads when used for connecting water services. Items included are bushings, couplings, elbows, nipples, plugs, and tees. Manufactured by Mueller, or equal approved by OWNER.

B. Fittings: All fittings shall be MJ Class 350 ductile iron and shall comply with AWWA C-153, AWWA C-111 and shall be cement lined as per AWWA C-104. All bolts for MJ fittings shall be Corten. Hydrant tees shall be MJ anchoring tees.

C. Valves: Valves shall be epoxy coated and supplied with mechanical joint accessories, high strength alloy steel bolts and heavy hexagon nuts conforming to ANSI/AWWA C111.A21.11.

Valve seal plate and bonnet shall have either all silicone bronze or 316 stainless steel bolts and nuts.

Gate Valve: Shall be 14 kg/cm^2 working pressure, non-rising stem, "O" ring, open right, mechanical joint, two-inch ductile iron operating nut with stainless steel bolt, either compound slide wedge mechanism metropolitan design conforming to ANSI/AWWA C500 or resilient seated gate valve conforming to ANSI/AWWA C509, manufactured by American Flow Control Series 2500, Mueller A 2360, or equal approved by OWNER.

D. Corporation Stops: 19 mm and 25 mm shall be brass, ball valve type construction with inlet CC thread and compression pack joint on the outlet, heavy patterns, and conforming to AWWA/ANSI C800.

38 mm and 50 mm shall be brass with inlet iron pipe thread and compression pack joint on the outlet, heavy patterns, and conforming to AWWA/ANSI C800.

Manufactured by Ford, Mueller, or equal approved by OWNER.

E. Curb Stop: Shall be brass, ball valve type, or approved equal with compression pack joints on either end and 24-inch stainless steel rod. Open left, no drain, heavy patterns, and conforming to AWWA/ANSI C800.

Manufactured by Ford or equal approved by OWNER.

F. Duc Lug and Tie Bolts: Tie bolts with hexagonal nuts shall be Star Supply Corp. or approved equal.

Duc lug bolts shall be Star Supply Corp. or approved equal.

G. Repair Clamps: Equal to Ford all stainless steel clamps, 50 mm - 300 mm diameter; brass, CPPJ - CPPJ, 3/4" - 2" diameter.

H. Mechanical Joint Restraints: All fittings, exclusive of hydrants, shall include mechanical joint restraints, “Grip Ring”, “Megalug”, or approved equal.

I. Repair Couplings: Equal to Rockwell cast couplings, 50 mm - 300 mm diameter; brass, CPPJ - CPPJ, 19 mm - 50 mm" diameter.

J. Valve Boxes: Shall be cast iron, manufactured in North America, two piece, sliding type with a top-flanged top section, no inside stops, and an outside shaft diameter of six inches. Bottom section shall be belled base. Length of top section shall be minimum of 61 cm. Middle and bottom section length as needed. Boxes shall have the word "WATER" clearly cast into the cover.

K. Valve Box Wrench: Provide one 2.4 meter long valve box wrench for 50 mm square gate valve nut.

L. Couplings: Solid sleeve MJ couplings or approved equal.

2.03 ACCESSORIES:

A. General: Provide anchorages for tees, plugs, and caps. After installation, apply a full coat of asphalt or other acceptable corrosion-retarding material to surfaces of rods and clamps.

B. Clamps, Straps and Washers: Steel, meeting or exceeding all requirements of the latest revision of ANSI/ASTM A506.

C. Rods: Stainless steel, meeting or exceeding all requirements of the latest revision of ANSI/ASTM A575.

D. Rod Couplings: Malleable iron, meeting or exceeding all requirements of the latest revision of ANSI/ASTM A197.

E. Cast Iron Washers: Meeting or exceeding all requirements of the latest revision of ANSI/ASTM A126, Class A.

F. Thrust Blocks: Shall be 210 kg/cm^2 concrete, size as shown on Drawings.

G. Pipe Lubricant: Suitable for use in potable water supply.

H. Trench Insulation: Shall be polystyrene foam insulation board equal to Styrofoam SM brand as manufactured by the Dow Chemical Co. or approved equal. Average compressive strength shall equal 2.8 kg/cm^2 with minimum of 1.75 kg/cm^2.

2.04 HYDRANTS:

A. General: All materials used in the production of fire hydrants for ordinary service shall conform to the specifications designated for each material listed in AWWA Standard C502. All hydrants shall be Mueller Super Centurion or Clow Eddy, or equal approved by the OWNER.

1. Traffic type at ground line
2. 1.5 meter bury
3. 150 mm mechanical joint
4. 133 mm valve opening – valve to open right (clockwise)
5. 50 mm – 63.5 mm NST hose nozzles
6. 25 mm –114 mm NST steamer nozzle
7. 49 mm nozzle cap nut

8. 49 mm operating nut – pentagon shape
9. 150 mm minimum inside barrel diameter
10. Without drain
11. All nuts and bolts below grade shall be Type 18 – 8 stainless steel attached by the manufacturer at the factory.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General: Install products in compliance with manufacturer's instructions. Provide restrained joints and thrust blocks at all fittings as detailed on the Drawings. Install all pipes in the dry. Prevent introduction of any groundwater or foreign materials into pipe during construction. Provide watertight plug in ends of pipe at all times when construction is not in progress. Coordinate all work with the Ellsworth Water Department. Existing water mains shall remain active at all times. CONTRACTOR shall coordinate connection of existing services to the new water main with Ellsworth Water Department.

B. Excavation: In general, pipe is to be laid at a depth that would be equal to installing the pipe with a depth of cover of 1.8 meters. Where existing or proposed pipes, conduits, culverts, cables, wires, etc. interfere with laying at this depth, the water pipe shall be laid at greater depth to clear the obstruction by at least forty-five (45) centimeters, where practical. Excavation shall be kept free of water and special precautions shall be taken to prevent entry of water, mud or other foreign substances into the line. Temporary caps shall be installed over all openings at the end of each day, when the work is suspended for period of 30 minutes or more (including lunch hours), or whenever necessary to protect the work in progress. Pipes shall be carefully lowered into the excavation, be guided into proper position, and joined to the preceding length or fitting. Suitable excavated material (i.e. free of stones and capable of being properly compacted) or borrow shall be placed and tamped under and around the pipe, taking care to maintain equal depth on both sides and to prevent movement of the pipe from its proper alignment. Where directed by the ENGINEER, due to soft or otherwise unsuitable bottom conditions, pipe bedding shall be placed in accordance with the crushed stone.

All pavements to be removed shall be sawn or uniformly trimmed (for concrete) at the pavement excavation pay limits prior to excavation unless otherwise approved by the ENGINEER.

The CONTRACTOR shall note that in some areas underground sewer mains and services, storm drains, telephone or communications cables, gas lines, and other below-ground utilities may exist in close proximity to the work. Effort has been made to indicate on the plans the approximate location of such utilities but this information is not guaranteed either as to accuracy or completeness. It shall be the CONTRACTOR’s responsibility to make a closer determination of the presence and location of all utilities known or suspected to be in close proximity to the work.

Excavation around other utilities, pipes, culverts, and similar installations shall be done with extreme care. It shall be the CONTRACTOR’s responsibility to contact the OWNER/operator of each utility to be encountered and obtain information relative to location and depth before excavating in the area. The CONTRACTOR shall promptly notify the Utility OWNER

concerned in the event of damage occurring during construction, whether caused by him or others.

In the event that underground utilities conflict with the location of the work, the CONTRACTOR shall promptly notify the ENGINEER and shall not disturb the conflicting utility until given specified instruction specifying the action to be taken.

Private utility (building drains, etc.) encountered in the work shall be brought to the attention of the ENGINEER and be handled in such manner as he directs.

Property owner's whose driveways will be blocked for a short period of time will be notified 24 hours in advance of the excavation so that vehicles can be removed when necessary. Driveway shall not be blocked at night without the expressed consent of the property owner.

C. Preparation of Water Line Trench Bottom: Pipe shall be laid directly on trench bedding containing coupling holes and shaped to provide continuous contact for the pipe barrel between coupling holes.

D. Bedding of Pipe: Buried ductile iron pipe shall be laid in accordance with AWWA C600 at the depth shown on the Drawings. At bell ends, holes shall be provided so that pipe lays flat on trench bedding. Refer to trench detail on Drawings.

E. Cutting Pipe: All cutting of iron pipe shall be done using an electrically, pneumatically, or gasoline operated machine. Blades shall be carbide tipped for cutting cement-lined iron pipe or abrasive type for proper material being cut. The machine used shall be portable saw equal to those made by Fein, Wache, or Homelite. When the cut end is to be used as a "Bell-Tite" or "Tyton" joint, it shall be tapered back on the outside of the cut about 1/8-inch, at an angle of about 30 degrees with the pipe center. This shall be done with a course file or portable grinder.

F. Connection to Existing Water Main: The CONTRACTOR shall locate and confirm sizes and materials of existing mains, excavate, cut out a section of existing main, install a tee, pipe, couplings and a valve, and backfill the excavation. The CONTRACTOR shall provide all materials, including mechanical joint accessories, valve boxes, and other items necessary to make all joints watertight and provide complete and effective connections to existing water mains. Existing water main shall remain active at all times.

G. Cleaning: Clear interior of pipe of dirt and other superfluous material as work progresses. Place plugs in end of uncompleted pipe whenever work stops.

H. Coordinate connections to existing water mains with the OWNER of the water mains. Provide 48 hours notice prior to such work. The CONTRACTOR is responsible for the cost and all work associated with connection to existing mains unless otherwise noted.

3.02 FLUSHING:

A. General: At completion of water service installation, flush and disinfect in conformance with AWWA C651. Prevent contaminated or highly chlorinated water from entering new or previously disinfected mains.

B. Flushing and Draining: Flush using water from existing main. CONTRACTOR shall coordinate with OWNER to obtain all water required. Provide a minimum flushing velocity within the pipe of 2.5 feet per second. CONTRACTOR to dispose of all water flushed from mains in accordance with applicable laws and regulations.

3.03 TESTING: Pressure and Leakage Testing.

A. CONTRACTOR to provide all labor, equipment, material, gauges, pumps, etc. to test for leaks in accordance with AWWA Standard C600 as follows:

1. Test newly laid pipe and valved sections at hydrostatic pressure of 10.5 kg/cm^2.

   a. Test pressure: System shall be tested at a hydrostatic test pressure of 10.5 kilograms per square centimeters.
   b. Test pressure: Not to exceed pipe or thrust restraint design pressures.
   c. Test duration: 2 hours, minimum.
   d. Pressure variation tolerance: less than +.35 kg/cm^2.
   e. Test pressure not to exceed valve or hydrant pressure ratings on sections including closed valves or hydrants.

2. Pressurization of Pipe:

   a. Fill each valved pipe section slowly with water at specified test pressure.
   b. Apply by means of pump or other approved method.

3. Air Removal:

   a. Expel all air from pipe, valves, and hydrants before applying test pressure.
   b. Install corporation stops at high point to vent air if no release valves available.
   c. After air removal close stops and apply test pressure.
   d. After test, remove stops and plug holes or leave stops in place permanently if directed by ENGINEER.

4. Examination:

   a. Examine exposed pipe, fittings, valves, hydrants, and joints during test.
   b. Repair or replace defective appurtenances discovered during test.

5. Leakage Test:

   a. Leakage: Quantity of water supplied to pipe test section to maintain pressure within +.35 kg/cm^2.

   b. Leakage shall not exceed the following limits:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

L = allowable leakage, in gallons per hour (gph)

S = length of pipe tested in feet
D = nominal pipe diameter, in inches
P = average pressure during test, in pounds per square inch (gauge)

c. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph/inch of nominal valve size shall be allowed.
d. Repair visible leaks regardless of leakage amount.
e. If failing leakage tests:
   1. Locate and correct leak.
   2. Repeat leakage test until passing test attained.

B. OWNER to perform operational testing of valves by opening and closing under water pressure to insure proper operation.

3.04 WATER MAIN DISINFECTION:

A. Provide injection tap at one end of the new water main and a sampling/flushing tap at the other end. Provide water pumps with adequate metering devices. Provide chlorine injection pumps or chlorinators which allow accurate measurement of chlorine being introduced to water service.

B. Personnel: Submit names of personnel or firm to perform disinfection work.

C. Disinfection Method: Disinfection shall be done using continuous feed method of chlorination as specified in AWWA C651 "Disinfecting Water Mains" as follows:

1. Water supplied from a temporary, backflow-protected connection to the existing distribution system or other approved supply source shall flow at a constant, measured rate into the newly installed water main. In the absence of a meter, the rate may be approximated using a Pitot gauge in the discharge, measuring the time to fill a container of known volume, or measuring the trajectory of the discharge and using the formula shown in Figure 2 of AWWA C651.

2. At a point no more than 3 meters downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine. To ensure that this concentration is provided, measure the chlorine concentration at regular intervals in accordance with the procedures described in the current edition of Standard Methods for the Examination of Water and Wastewater or AWWA Manual M12, or using appropriate chlorine test kits.

3. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. At the end of this 24-hour period, the treated water in all portions of the main shall have a residual of not less than 10 mg/L of free chlorine.

D. Final Flushing: Following disinfection, final flushing shall be done as specified in Section 4.5 of AWWA C651 as follows:

1. After the 24-hour retention period, heavily chlorinated water should not remain in prolonged contact with pipe. In order to prevent damage to the pipe lining or to prevent corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or that is acceptable for domestic use.

2. The ENGINEER shall inspect the environment to which the chlorinated water is to be discharged. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the water to be wasted by CONTRACTOR to neutralize thoroughly the residual chlorine.

E. Bacteriological Testing: Following disinfection and final flushing, bacteriological testing shall be done as specified in Section 5 of AWWA C651 as follows:

1. After final flushing and before the new water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main. At least one set of samples shall be collected from every 365 meters of the new water main, plus one set from the end of the line and at least one set from each branch.

2. All samples shall be tested for bacteriological quality in accordance with Standard Methods for the Examination of Water and Wastewater, and shall show the absence of coliform organisms.

3. If the initial disinfection fails to produce satisfactory bacteriological results, the new main shall be re-flushed and re-sampled. If check samples also fail to produce acceptable results, the main shall be re-chlorinated by the continuous-feed or slug method until satisfactory results are obtained.

*** END OF SECTION ***

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Work included: All excavating, filling, backfilling, and removal of materials.

Earthwork for utilities is included in this section.

1.02 PROTECTION:

A. Paved surfaces: Do not operate equipment on paved surfaces which will damage these surfaces.

B. Maintain excavations with approved barricades, lights, and signs to protect life and property until excavation is filled and graded to a condition acceptable to the ENGINEER.

C. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

D. Provide Preblast Survey in accordance with 3.02A of this section.

1.03 QUALITY ASSURANCE:

A. Testing and Inspection: Testing costs, that are specified as OWNER's responsibility shall be paid for by the CONTRACTOR using an allowance as noted in Section 01025. All testing costs specified as the CONTRACTOR's responsibility shall remain so and in no way shall the included allowance be used for such costs. All testing costs shall be billed directly to CONTRACTOR, and a final Charge Order will be issued balancing the actual testing costs to the OWNER, and stated allowance.

B. Seismic and Preblast Survey Firm: Company specializing in seismic surveys with five years documented experience.

C. Explosives Firm: Company specializing in explosives for disintegration of subsurface rock with five years documented experience.

D. If there is a discrepancy between these specifications and the MDOT specifications, the MDOT or the more restrictive will prevail.

1.04 REFERENCES:

A. NFPA 495 - Code for the Manufacturer, Transportation, Storage, and Use of Explosive Materials.

1.05 REGULATORY REQUIREMENTS:

A. Conform to applicable codes & NFPA 495 for explosive disintegration of rock.

B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

1.06 SUBMITTALS:

A. Test Reports: Submit the following:
Reports on material gradations.

B. Blasting Records: See paragraph 3.02B.

1.07 JOB CONDITIONS:

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR. Data is made available for convenience of CONTRACTOR.

Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to OWNER.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

C. Use of Explosives: Permitted, see Part 3 - Execution for requirements.

PART 2 - MATERIALS

2.01 MATERIALS:

A. General:

1. Suitable materials: As shown on the Drawings or as specified.
2. Unsuitable materials: Material containing excessive plastic clay, vegetation, organic matter, debris, pavement, stones or boulders over 150 mm in greatest dimension, and frozen material. Material which, in the opinion of the ENGINEER, will not provide a suitable foundation or subgrade.
3. On-Site Material: Any suitable material from on-site excavation.
4. Material for embankments and general fills may contain pieces of excavated ledge having a greatest dimension of up to 150 mm if approved by the ENGINEER.
5. Inspection: The ENGINEER may inspect off-site sources of materials and order tests of these materials to verify compliance with these Specifications.

B. Gravel (Aggregate Subbase): Hard, durable stone with coarse to fine sand. All particles shall pass the 150 mm sieve and meet MDOT "Standard Specification" Section 703.06 Type D aggregate. That portion which passes the 75 mm sieve shall have the following sieve analysis by weight:

Sieve size	% Passing

75 mm	100
6.3 mm	25-70
425 µm	0-30
75 µm	0- 7

C. Sand: Sieve analysis by weight:

Sieve Size	Max % Passing by Weight
9.5 mm	100
4.75 mm	95-100
1.18 mm	50- 85
150 µm	2- 10

D. 19 mm Crushed Stone: Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight:

Sieve Size	Max % Passing by Weight
25 mm	100
19 mm	95-100
12.5 mm	35- 70
9.5 mm	0- 25
75 µm	0- 2

E. 39 mm Crushed Gravel: Well graded hard, durable particles. Sieve analysis by weight:

Sieve Size	Max % Passing by Weight
50 mm	100
4.75 mm	5
75 µm	10

F. Refill Material: Crushed stone for refilling excavation below grade or rock excavation unless otherwise directed by the ENGINEER.

G. Common Borrow: Earth suitable for embankment construction free from frozen material, perishable rubble, peat and other unsuitable material.

Moisture content: Sufficient to provide required compaction and stable embankment but not exceeding 4% above optimum as determined using AASHTO T180, method C or D.

H. Select Backfill: Use gravel as specified above.

I. Underdrain Filter Sand: Granular material for underdrain shall be free from organic matter and shall conform to the MDOT "Standard Specifications" Section 703.22 for underdrain Type B. Sieve analysis by weight:

Sieve Size*	Max % Passing by Weight

19 mm	95-100
12.5 mm	75-100
4.75 mm	50-100
850 µm	15- 80
300 µm	0- 15
75 µm	0- 5

PART 3 - EXECUTION

3.01 EXCAVATION:

A. General: Remove all materials encountered to the limits shown on the Drawings, or designated in the Specifications.

B. Classifications: The following classifications of excavation may be made which will be paid for on a unit cost basis:

Rock Excavation

Excavation below normal grade

Select backfill

Measurement and payment for these classifications are described in Section 01025.

Do not perform rock excavation or excavation of unsuitable materials until material to be excavated has been cross-sectioned and classified by ENGINEER.

Predrilling and blasting of bedrock through overburden may be allowed. However, if this method is used, the rock excavation quantities will be adjusted downward in proportion to the ground swell from this blasting method.

C. Earth excavation: Removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation.

D. Rock excavation: Removal and disposal of materials that cannot be excavated without drilling and blasting, or requiring use of special equipment, except such materials that are classified as earth excavation.

Typical materials classified as rock are solid rock, rock in ledges, and rockhard cementitious aggregate deposits two cubic yards or more in volume.

Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

Rock excavation does not include:

Removal of material which can be removed with a hand pick or power shovel.
Loose or previously blasted rock or broken stone in rock fills or elsewhere.

E. Rock payment lines:

Pipe trenches: as shown on Drawings or as required for installation of manholes, pipe and bedding material.

G. Excavation in Paved Areas: Cut pavement prior to excavation to provide a clean, uniform edge. Minimize disturbance of remaining pavement. Cut and remove the minimum amount of pavement required to do the Work.

Use shoring and bracing where sides of excavation will not stand without undermining pavement.

H. Excavation for Trenches: Excavate to widths shown on the Drawings.

Produce an evenly graded flat trench bottom at the subgrade elevation required for installation of pipe and bedding material.

Load excavated material directly into trucks unless otherwise permitted by the ENGINEER.

Place backfill material directly into trench or excavation. Do not stockpile material to be used as backfill in roadways or along edges of trenches.

I. Unauthorized excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of ENGINEER. Unauthorized excavation, as well as remedial Work directed by ENGINEER including refilling, is at CONTRACTOR's expense.

J. Refilling Unauthorized Excavation:

Trenches: Use crushed stone or gravel as directed by ENGINEER.

Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by ENGINEER.

K. Excavation of Unsuitable Materials: When excavation has reached required subgrade elevations, notify ENGINEER who will make an inspection of conditions. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper as directed by ENGINEER and replace excavated material with gravel or crushed stone.

Removal of unsuitable material and its replacement as directed will be paid for at CONTRACT PRICE as described in Section 01025.

L. Material Storage: Stockpile and maintain suitable surplus excavated materials for re-use as backfill anywhere within the PROJECT limits as directed by the ENGINEER. Place, grade and shape stockpiles for proper drainage.

Locate and retain soil materials away from edge of excavations.

3.02 BLASTING

A. General: Obtain approval of OWNER before blasting.

Perform blasting in accordance with the following:

1. "Manual of Accident Prevention in Construction" issued by Associated General Contractors of America, Inc.

2. "Construction Safety Rules and Regulations" as adopted by the State Board of Construction Safety, Augusta, Maine.

3. Section 107.12 of the "Standard Specifications", Maine Department of Transportation.

B. Submit an accurate record on an approved form, containing the following information of each blast to the ENGINEER on a daily basis.

1. General location of blast.

2. Depth and number of drillholes.

3. Type and quantity of explosive used.

4. Time of blast.

5. Seismographic record of each blast taken at nearest structure.

C. Preblast Survey will be done by CONTRACTOR: Provide preblast survey prior to any blasting or blasting related operations. Survey to be performed by an independent business entity with a minimum 5 years experience in similar type surveys.

1. Preblast Survey to include but not be limited to:

a. Still photos taken at 15 meter maximum stationing. (101 mm x 150 mm glossy color prints).

b. Video tape of entire construction area.

c. Video tape of each structure within construction area to show both interior and exterior preblast conditions. Highlight existing defects in structures and pavements. Provide some means of establishing scale of existing defects. i.e.: include tape measure or folding ruler at defect during video taping.

d. Video taping must be done with commercial grade equipment to allow equipment still viewing without distortion of the viewed area.

e. Still photos and video tapes shall be retained by the preblast surveyor and shall be available for viewing by the OWNER and ENGINEER within 24 hours upon request.

3.03 STABILITY OF EXCAVATIONS

A. General: Slope sides of excavations to comply with OSHA Regulations and Local Codes. Shore and brace where sloping is not possible due to space restrictions or stability of material excavated.

Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3.04 DEWATERING:

General: Perform all Work in the dry. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding PROJECT site and surrounding area.

Do not allow water to accumulate in excavations. Provide and maintain pumps, dewatering system components necessary to convey water away from excavations.

Convey water removed from excavations and rain water to collecting or run-off areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

3.05 BACKFILL AND FILL:

A. General: Place acceptable soil material in layers to required elevations as shown on the Drawings and as listed below.

Fill, backfill, and compact to produce minimum subsequent settlement of the material and provide adequate support for the surface treatment or structure to be placed on the material. Place material in approximately horizontal layers of beginning at lowest area to be filled. Do not impair drainage.

B. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Scarify surfaces so that fill material will bond with existing surface.

When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

C. Placement: Place backfill and fill materials in layers not more than 300 mm in loose depth for material compacted by heavy compaction equipment, and not more than 150 mm in loose depth for material compacted by hand-operated tampers. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift.

Do not allow heavy machinery within 1.5 meters of structure during backfilling and compacting.

D. Backfill excavations as promptly as Work permits, but not until completion of the following:

Acceptance of construction below finish grade including, dampproofing, waterproofing, and perimeter insulation.

Inspection and recording locations of underground utilities.

Removal of concrete formwork.

Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.

Removal of trash and debris.

Permanent or temporary horizontal bracing is in place on horizontally supported walls.

Backfill cast-in-place concrete structures when the concrete has developed adequate strength.

Use care in backfilling to avoid damage or displacement of underground structures and pipe.

Backfill under all existing utility pipes crossed by sewer construction with 19 mm crushed stone. The crushed stone back- fill will extend continuously from the bedding of the new sewer to the utility pipe crossed, including a 6" thick envelope of crushed stone all around the existing utility pipes.

The 19 mm crushed stone backfill shall stand at its own angle of repose. No "haunching" or "forming" with common fill will be allowed.

E. Backfilling Trenches: See Trench Detail on the Drawings.

Bed pipe in crushed stone. Limits of bedding and requirements for remaining trench backfill described in Section 02665.

Trenches in cross-country runs: Restore surface to that existing prior to construction. Mound trench 150 mm above existing grade if required by the ENGINEER.

F. Replacement of unsuitable materials:

Below normal grade: see paragraph 3.01K.

Above normal grade: replace unsuitable material with suitable stored onsite material. All excess suitable on-site material must be used before additional off-site material is used. If additional material is required use Select Backfill.

3.06 COMPACTION:

A. Methods: Use methods which produce the required degree of compaction throughout the entire depth of material placed without damage to new or existing facilities and which are approved by the ENGINEER. Adjust moisture content of soil as required. Remove and replace material which is too wet to compact to required density. Compact each horizontal layer of till and slopes as Work progresses.

B. Degree of Compaction: Compact to the following minimum densities:

FILL AND BACKFILL LOCATION	DENSITY
Under structure foundations	95% of max.
61 cm under pavement and above	95%
61 cm under pavement and below	92%
Trenches through unpaved areas	90%
Embankments (including slopes)	90%
Pipe Bedding	92%
Beside structure foundation walls, and retaining walls tank walls,	90%
Under pipes through structural fills	90%

Maximum density: ASTM D1557, modified.
Field density tests: ASTM D1556 (sand cone) or ASTM D2167 (rubber balloon), or ASTM D2922 (nuclear methods).

C. Testing:

Determine actual in place densities using field tests as directed by the ENGINEER. Tests will be made by an independent laboratory. Costs for initial tests will be paid by OWNER, under allowance as established under Bid Item 832.07. Failing tests and subsequent retests will be paid by CONTRACTOR.

Perform additional Work to obtain proper compaction if in-place densities do not meet the specified densities. Retesting may be required by the ENGINEER.

D. Minimum Number of Tests:

Paved Areas and Building Subgrade: Make at least one field density test of subgrade for every 185 square meters of paved area or building slab, but in no case less than 3 tests.

Other Areas: In each compacted fill layer, make one field density test for every 185 square meters of overlaying building slab or paved area, but in no case less than 3 tests.

3.07 GRADING:

A. Grading Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Structure Lines: Grade areas adjacent to structure lines to drain away from structures and to prevent ponding.

C. Finish surfaces free from irregular surface changes, and as follows:

Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 30 mm above or below required subgrade elevations.

Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 13 mm above or below required subgrade elevation.

Fill Under Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 300 mm when tested with a 3 meter straightedge.

D. Compaction: After grading, compact subgrade surfaces to the percentage of maximum density for each area classification.

3.08 MAINTENANCE:

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.09 DISPOSAL OF EXCESS MATERIALS:

A. Removal from Site:

Remove excess excavated material, and dispose of it in approved spoils areas.

Grade material to the satisfaction of the OWNER of the property on which the material is deposited. Keep roads free of debris. Use suitable watertight vehicles for hauling wet materials over roads and streets. Clean up materials dropped from or spread by vehicles promptly or when directed by the ENGINEER.

*** END OF SECTION ***

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: This Section describes the measurement and payment for the Work to be completed under each Base Bid item in the Bid Form. The descriptions may not reference all of the associated Work.

B. Payment Procedures are described in the agreement, General Conditions and related documents.

1.02 DESCRIPTION OF BASE BID ITEMS

A. Items 823.3256 - Live Tap Connection 300 mm Main for 200 mm and 150 mm Branch Lines

1. Payment: Unit Price per each tap as stated in the Bid Form.

2. Measurement: Measured per each unit installed.

3. Includes: Provide all labor and material required to complete each live connection of the existing 300 mm High Street water main for branch lines where indicated on the Drawings or as coordinated with the Ellsworth Water Department including excavation, backfill, shoring and bracing, piping, dewatering, bedding, tapping sleeve, thrust blocks, and all other materials and labor required to provide a complete live connection installation. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

B. Items 823.325 and 823.331 - 200 mm and 150 mm Gate Valves

1. Payment: Unit price per each as stated in the Bid Form.

2. Measurement: Measured per each unit installed.

3. Includes: Provide valve and valve box, providing one valve box wrench to be used for all gate valves, and all other materials and labor required to provide a complete installation as specified and shown on the Drawings. Gate valves for hydrants are not included in this item and shall be included in Item 824.30 - Fire Hydrant. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

C. Items 822.34 and 822.33 - 200 mm and 150 mm Class 52 D.I. Pipe

1. Payment: Unit price per meter as stated in the Bid Form. For the purpose of partial payment, the following schedule shall apply:

Installation and backfill	70%
Successful testing and disinfection by CONTRACTOR	25%
Satisfactory cleanup and surface restoration	5%

2. Measurement: As measured along the horizontal projection of the centerline of the pipe.

3. Includes: Excavation, backfill, shoring and bracing, dewatering, bedding, pipe, fittings, thrust blocks, flushing, testing, disinfection, and all other materials and labor required to provide a complete installation not specified elsewhere. The connection to existing water mains shall be incidental to this item. Ductile iron pipe used in hydrant laterals shall not be included in this item and shall be included in Item 824.30-Fire Hydrant. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

D. Item 824.30 - Fire Hydrant

1. Payment: Unit price per each as stated in the Bid Form.

2. Measurement: Measured per each unit installed.

3. Includes: Provide all fittings, pipe, hydrant tee, 150 mm gate valve, valve box, thrust blocks, accessories, earthwork and materials, and all other materials and labor required to provide a complete hydrant and assembly installation as specified and shown on the Drawings. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

E. Item 824.31 - Remove Fire Hydrant

1. Payment: Unit price per each as stated in the Bid Form.

2. Measurement: Measured per each unit removed.

3. Includes: All materials and labor required to provide remove hydrant and assembly as specified and shown on the Drawings. CONTRACTOR shall salvage the existing hydrant and gate valve and deliver to the OWNER at the completion of the project. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

F. Items 825.41, 825.43, and 825.431 - 19 mm, 25 mm, and 38 mm Copper Services

1. Payment: Unit price per meter as stated in the Bid Form.

2. Measurement: As measured in place along the horizontal centerline of the water

service from centerline of water main to existing water service.

3. Includes: Service replacement shall include excavation, backfill, shoring and bracing, dewatering, bedding, pipe, fittings, corporation stop, curb stops, service boxes, and all other materials and labor required to provide a complete system not specified elsewhere. Some of the services may involve only connection of existing copper services to the proposed water main. The CONRACTOR will coordinate with the Ellsworth Water Department to determine which services shall be completely replaced. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

G. Item 832.065 - Temporary Piping

1. Payment: Lump Sum as stated in the Bid Form. For the purpose of partial payment, the following schedule shall apply:

Installation, Flushing, and Disinfection	75%
Removal	25%

2. Measurement: As determined by the Owner or Engineer's representative based on the percentage of work completed.

3. Includes: All temporary piping necessary to provide uninterrupted service in all areas within or affected by the Project area including installation, testing, and disinfection. The connection to the existing water system shall be incidental to this item. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

H. Item 827.33 - Trench Insulation

1. Payment: Unit price per meter as stated in the Bid Form.

2. Measurement: Measured in place as shown on the Drawings or as directed by the ENGINEER.

3. Includes: Insulation over pipe as shown on the Drawings or as directed by the ENGINEER in the field. Insulation to be 50 mm thick and 1.2 meter wide. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

I. Item 827.301 - Rock Excavation Water Main

1. Payment: Unit price per cubic meter as stated in the Bid Form for all rock excavation required for installation of piping, etc.

2. Measurement: Measurement in place prior to excavation within pay limits shown on the Drawings or as Specified.

3. Includes: Drilling and blasting, excavation, removal, disposal of rock and boulders greater than 1.5 cubic meters each and replacement as necessary with suitable material as directed by the ENGINEER. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

J. Item 827.311 - Unsuitable Soil Excavation, Remove and Refill

1. Payment: Unit price per cubic meter as stated in the Bid Form.

2. Measurement: As measured by the ENGINEER within the limits as Specified or directed.

3. Includes: Excavation and replacement of materials determined by the ENGINEER as unsuitable for pipe or structure subgrade. Work specified but not specifically designated as a Bid item is considered incidental to this Bid items.

K. Item 832.07 - Owner's Testing Allowance

1. Payment: Actual costs incurred.

2. Measurement: Submit bills from testing firm.

3. Includes: Testing costs, such as compaction tests, etc., that are specified as OWNER's responsibility shall be paid for by the CONTRACTOR using the allowance allotted in this item. All testing costs specified as the CONTRACTOR's responsibility shall remain so and in no way shall the included allowance be used for such costs. All testing costs shall be billed directly to CONTRACTOR, and a final Charge Order will be issued balancing the actual testing costs to the OWNER, and stated allowance.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL:

A. Measurement: Notify ENGINEER when necessary measurements must be taken. Do not proceed until measurements have been taken.

B. Submit EJCDC No. 1910-8-E Application for Payment for completed and measured items. In addition to supporting documentation, CONTRACTOR shall complete and submit with each Application for Payment a Survey Tie Sheet for each utility structure, pipe and appurtenance installed since submission of the previous Application for Payment. Applications for Payment submitted without the necessary Survey Tie Sheets shall be considered incomplete by the ENGINEER and shall be returned to the CONTRACTOR.

DWSRF Supplemental General Conditions for Projects Done In Conjunction with MDOT
2/6/04

1. **Disclaimer**

   The Water Utility portion of this contract is expected to be funded in part by a State Revolving Loan.

   The Department of Human Services is not party to any portion of this overall contract.

2. **Inspection**

   The Department of Human Services shall have access to the project site for inspection of the Water Utility work

3. **Access to Records**

   DHS, MMBB, and US Comptroller General, or any authorized representatives shall have the right to access records from the Department of Transportation pertinent to this project.

*** END OF SECTION ***

Site Layout Pay Items and Quantities List
Plan Sheet CP101-G1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'A'	Each	4
634.21	Conventional Light Standard - Site Light 'A' w/ Flag Mount	Each	10
626.31	Site Light Base	Each	14
841.48	12" Granite Bollard	Each	33
841.48	8" Granite Bollard	Each	8
507.086	Steel Rail	Each	22
201.3	Tree Grate 'A'	Each	15
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	147

Site Layout Pay Items and Quantities List
Plan Sheet CP101-A1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'A'	Each	1
634.21	Conventional Light Standard - Site Light 'A' w/ Flag Mount	Each	6
626.31	Site Light Base	Each	7
841.48	12" Granite Bollard	Each	12
841.48	8" Granite Bollard	Each	8
507.086	Steel Rail	Each	7
201.3	Tree Grate 'A'	Each	8
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	32

Site Layout Pay Items and Quantities List
Plan Sheet CP102-G1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'A'	Each	5
634.21	Conventional Light Standard - Site Light 'A' w/ Flag Mount	Each	7
626.31	Site Light Base	Each	12
841.48	12" Granite Bollard	Each	14
841.48	8" Granite Bollard	Each	10
507.086	Steel Rail	Each	8
201.3	Tree Grate 'A'	Each	18
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	33

Site Layout Pay Items and Quantities List
Plan Sheet CP102-A1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'A'	Each	2
634.21	Conventional Light Standard - Site Light 'A' w/ Flag Mount	Each	2
634.21	Conventional Light Standard - Site Light 'B'	Each	1
634.21	Conventional Light Standard - Site Light 'B' w/ Flag Mount	Each	3
626.31	Site Light Base	Each	8
841.48	12" Granite Bollard	Each	2
841.48	8" Granite Bollard	Each	11
507.086	Steel Rail	Each	1
201.3	Tree Grate 'A'	Each	4
201.3	Tree Grate 'B'	Each	6
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	31

Site Layout Pay Items and Quantities List
Plan Sheet CP103-G1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'B'	Each	7
634.21	Conventional Light Standard - Site Light 'B' w/ Flag Mount	Each	3
626.31	Site Light Base	Each	10
841.48	8" Granite Bollard	Each	10
201.3	Tree Grate 'B'	Each	13
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	31

Site Layout pay items and Quantities
Plan Sheet CP103-A1

Item Number	Item Description	Unit	Qty
634.21	Conventional Light Standard - Site Light 'B'	Each	6
634.21	Conventional Light Standard - Site Light 'B' w/ Flag Mount	Each	4
626.31	Site Light Base	Each	10
841.48	8" Granite Bollard	Each	9
201.3	Tree Grate 'B'	Each	8
403.1021	Textured Asphalt Pavement - StreetPrint Duratherm	M2	115

Site Pedestrian Lighting Conduit Pay Items and Quantities
Plan Sheet CP101-103

Item Number	Item Description	Unit	Qty
634.32	Trenching for Electrical Work	M	2258.57
634.317	#10 AWG Wire (CU)	M	1476.76
634.318	#4 AWG Wire (CU)	M	3351.28
634.319	#3 AWG Wire (CU)	M	1947.67
634.195	1.5" Sch. 80 PVC	M	2296.67

SECTION 16521 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details Rev. Dec.2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior luminaires with lamps and ballasts.
2. Poles and accessories.

1.3 DEFINITIONS

A. CRI: Color-rendering index.

B. HID: High-intensity discharge.

C. Luminaire: Complete lighting fixture, including ballast housing if provided.

D. Pole: Luminaire support structure.

E. Standard: Same definition as "Pole" above.

1.4 SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.

    a. Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

6. Ballasts, including energy-efficiency data.
7. Lamps, including life, output, and energy-efficiency data.

8. Materials, dimensions, and finishes of poles.
9. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
10. Anchor bolts for poles.

B. Shop Drawings:

1. Anchor-bolt templates keyed to specific poles and certified by manufacturer.

C. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.

D. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with IEEE C2, "National Electrical Safety Code."

D. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Package aluminum poles for shipping according to ASTM B 660.

B. Store poles on decay-resistant-treated skids at least 300 mm (12 inches) above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: Three years from date of Substantial Completion.
2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. Warranty Period for Lamps: Replace lamps that fail within 12 months from date of Substantial Completion; furnish replacement lamps that fail within the second 12 months from date of Substantial Completion.

5. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In Exterior Lighting Device Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

1. Manufacturer: Provide products by the manufacturer specified.
2. Basis of Design Product: The design of each item of exterior luminaire and its support is based on the product named.

2.2 LUMINAIRES, GENERAL REQUIREMENTS

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

J. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

K. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

L. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.3 BALLASTS FOR HID LAMPS

A. Comply with ANSI C82.4 and UL 1029.

B. High-Pressure Sodium Ballasts: Electromagnetic type with solid-state igniter/starter and capable of open-circuit operation without reduction of average lamp life. Igniter/starter shall have an average life in pulsing mode of 10,000 hours at an igniter/starter-case temperature of 90 deg C.

1. Minimum Starting Temperature: Minus 34 deg C (Minus 30 deg F).
2. Normal Ambient Operating Temperature: 40 deg C (104 deg F).

2.4 HID LAMPS

A. High-Pressure Sodium Lamps: ANSI C78.42, CRI 21 (minimum), color temperature 1900 K, and average rated life of 24,000 hours, minimum.

2.5 POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS

A. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.

B. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Shall not cause galvanic action at contact points.
2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication, unless stainless-steel items are indicated.
3. Anchor-Bolt Template: Plywood or steel.

C. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Division 3.

D. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

2.6 ALUMINUM POLES

A. Poles: Seamless, extruded structural tube complying with ASTM B 429, Alloy 6063-T6 with access handhole in pole wall.

1. Shape: Round, straight.
2. Mounting Provisions: Butt flange for bolted mounting on foundation.

B. Pole-Top Tenons: Fabricated to support luminaire indicated, and securely fastened to pole top.

C. Grounding and Bonding Lugs: Welded 13-mm (1/2-inch) threaded lug, complying with requirements in Division 16 Section "Grounding and Bonding," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

D. Aluminum Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.7 POLE ACCESSORIES

A. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.

B. Decorative accessories, supplied by decorative pole manufacturer, include the following:

1. Banner Arms: Single assembly for 4” O.D. pole, 18” arm.

2.8 REQUIREMENTS FOR INDIVIDUAL EXTERIOR LIGHTING DEVICES

A. Exterior Lighting Device Type A:

1. Basis-of-Design Product: Architectural Area Lighting, model #PRMS H5/70HPS/DB3/4R10-125/ ATG/LDL.
2. Voltage: 120-V ac.
3. Nominal Dimensions: 915 mm by 480 mm diameter (36 inches by 19 inches diameter).
4. Lamp: 70 Watt high pressure sodium.
5. Ballast Type and Features: High power factor, mounted to cast holder for maximum heat dissipation.
6. Photoelectric Control: Remote mounted.
7. Lens: One piece lightly diffused injection molded optical grade, DR acrylic.
8. Reflector: Segmented, specular and semi specular Alzak® panels.
9. IESNA Lateral Distribution Class: V.
10. IESNA Cutoff Category: Cutoff.
11. Pole Description:

    a. Material or Type: Aluminum.
    b. Luminaire Support Components and Accessories: Pole-top tenon, and grounding and bonding lug.
    c. Mounting Provisions: Concrete foundation.
    d. Luminaire Mounting Height above Finished Grade: 3.6 m (12 feet).

B. Exterior Lighting Device Type B:

1. Basis-of-Design Product: Architectural Area Lighting, model #PRM3-PM H5/70HPS/BC5-4/ PR4/4R10-125/BLK/FTG.

2. Voltage: 120-V ac.
3. Nominal Dimensions: 710 mm by 460 mm diameter (28 inches by 18 inches diameter).
4. Lamp: 70 Watt high pressure sodium.
5. Ballast Type and Features: High power factor, mounted to cast holder for maximum heat dissipation.
6. Photoelectric Control: Remote mounted.
7. Lens: Clear, flat, tempered glass.
8. Reflector: Segmented, specular and semi specular Alzak® panels.

9. IESNA Lateral Distribution Class: V.
10. IESNA Cutoff Category: Cutoff.
11. Pole Description:

    a. Material or Type: Aluminum.
    b. Luminaire Support Components and Accessories: Pole-top tenons and a grounding and bonding lug.
    c. Mounting Provisions: Concrete foundation.
    d. Luminaire Mounting Height above Finished Grade: 3.6 m (12 feet).

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Install lamps in each luminaire.

3.2 POLE INSTALLATION

A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Division 3.

C. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

    1. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
    2. Install base covers, as indicated.
    3. Use a short piece of 13-mm- (1/2-inch-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

D. Pole Foundations Set in Concrete Paved Areas: Install poles with minimum of 150-mm- (6-inch-) wide, unpaved gap between the pole or pole foundation and the edge of adjacent concrete slab. Fill unpaved ring with pea gravel to a level 25 mm (1 inch) below top of concrete slab.

E. Raise and set poles using web fabric slings (not chain or cable).

3.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Division 16 Section "Raceways and Boxes." In concrete foundations, wrap conduit with 0.254-mm- (0.010-inch-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 GROUNDING

A. Ground metal poles and support structures according to Division 16 Section "Grounding and Bonding."

1. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

3.5 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

1. Verify operation of photoelectric controls.

END OF SECTION 16521

SECTION 16211 - ELECTRICITY METERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes equipment for utility company's electricity metering.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Owner's written permission.

1.5 COORDINATION

A. Electrical Service Connections: Coordinate with utility companies and components they furnish as follows:

1. Comply with requirements of utilities providing electrical power.
2. Coordinate installation and connection of utilities and services, including provision for electricity-metering components.

PART 2 - PRODUCTS

2.1 EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY

A. Meter Sockets: Comply with requirements of electrical power utility company.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with equipment installation requirements in NECA 1.

B. Install equipment for utility company metering. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

END OF SECTION 16211

SECTION 16442 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Load centers.

1.3 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current rating of panelboards and overcurrent protective devices.
d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Panelboard Schedules: For installation in panelboards.

D. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not below minus 40 deg C (minus 40 deg F) or exceeding 40 deg C (104 deg F).
2. Altitude: Not exceeding 2000 m (6600 feet).

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Owner's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

a. Eaton Corporation; Cutler-Hammer Products.
b. General Electric Co.; Electrical Distribution & Protection Div.
c. Siemens Energy & Automation, Inc.
d. Square D.

2.2 MANUFACTURED UNITS

A. Enclosures: Surface-mounted cabinets. NEMA PB 1.

1. Rated for environmental conditions at installed location.

a. Outdoor Locations: NEMA 250, Type 3R.

2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
4. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

B. Phase and Ground Buses:

1. Material: Tin-plated aluminum.

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

C. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

D. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.3 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.4 LOAD CENTERS

A. Overcurrent Protective Devices: Plug-in, full-module circuit breaker.

B. Conductor Connectors: Mechanical type for main, neutral, and ground lugs and buses.

2.5 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Mount plumb and rigid without distortion of box.

C. Install overcurrent protective devices and controllers.

D. Install filler plates in unused spaces.

E. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Create a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

3.3 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."

B. Connect wiring according to Division 16 Section "Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Perform the following field tests and inspections:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.5 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 16442

SECTION 16060 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes methods and materials for the following special application:

1. Underground distribution grounding.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 6 mm (1/4 inch) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 41 mm (1-5/8 inches) wide and 1.6 mm (1/16 inch) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 41 mm (1-5/8 inches) wide and 1.6 mm (1/16 inch) thick.

C. Bare Grounding Conductor and Conductor Protector for Wood Poles:

1. No. 4 AWG minimum, soft-drawn copper.

2. Conductor Protector: Half-round PVC or wood molding. If wood, use pressure-treated fir or cypress or cedar.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 19 mm by 3 m (3/4 inch by 10 feet) in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 100 mm (4 inches) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 50 mm (2 inches) above to 150 mm (6 inches) below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Rods: Drive rods until tops are 50 mm (2 inches) below finished floor or final grade, unless otherwise indicated.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
b. Perform tests by fall-of-potential method according to IEEE 81.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Manhole Grounds: 10 ohms.

C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 16060

SECTION 16072 - ELECTRICAL SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Construction requirements for concrete bases.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions.

B. Construct concrete bases of dimensions indicated but not less than 100 mm (4 inches) larger in both directions than supported unit, and so expansion anchors will be a minimum of 10 bolt diameters from edge of the base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
4. Use 20.7-MPa (3000-psi), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 3.

END OF SECTION 16072

SECTION 16120 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Southwire Company.

B. Aluminum and Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Stranded.

B. Branch Circuits: Copper for branch circuits smaller than No. 4 AWG; copper or aluminum for branch circuits No. 4 AWG and larger. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND WIRING METHODS

A. Feeders: Type THHN-THWN, single conductors in raceway.

B. Branch Circuits: Type THHN-THWN, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

B. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

C. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

C. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 16120

SECTION 16130 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. Related Sections include the following:

1. Division 2 Sections for exterior manholes and underground utility construction.

1.3 DEFINITIONS

A. IMC: Intermediate metal conduit.

B. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For hinged-cover enclosures and cabinets.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.

3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.

1. Comply with NEMA RN 1.
2. Coating Thickness: 1 mm (0.040 inch), minimum.

D. Fittings for Conduit and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 1 mm (0.040 inch), with overlapping sleeves protecting threaded joints.

E. Joint Compound for Rigid Steel Conduit: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.; Pipe & Plastics Group.
6. Condux International, Inc.
7. Electri-Flex Co.
8. Lamson & Sessions; Carlon Electrical Products.
9. Manhattan/CDT/Cole-Flex.
10. RACO; a Hubbell Company.
11. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule EPC-80-PVC, unless otherwise indicated.

C. Fittings for RNC: NEMA TC 3; match to conduit material.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Erickson Electrical Equipment Company.

4. Hoffman.
5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
6. O-Z/Gedney; a unit of General Signal.
7. RACO; a Hubbell Company.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet Division.
10. Spring City Electrical Manufacturing Company.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Nonmetallic Device Boxes: NEMA OS 2.

C. Hinged-Cover Enclosures: NEMA 250, Type 3R, with continuous-hinge cover with flush latch, unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Description: Comply with SCTE 77.

1. Color of Frame and Cover: Gray.
2. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, "ELECTRIC."
6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. Handholes shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. Armorcast Products Company.
b. Carson Industries LLC.
c. CDR Systems Corporation.
d. NewBasis.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:

1. Exposed Conduit: IMC.
2. Concealed Conduit, Aboveground: IMC.
3. Underground Conduit: RNC, Type EPC-80-PVC, direct buried.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
5. Application of Handholes and Boxes for Underground Wiring:

    a. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer-concrete units, SCTE 77, Tier 8 structural load rating.

B. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Complete raceway installation before starting conductor installation.

C. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

D. Threaded Conduit Joints, Exposed to Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

E. Raceway Terminations at Locations Subject to Moisture: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

F. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 90-kg (200-lb) tensile strength. Leave at least 300 mm (12 inches) of slack at each end of pull wire.

G. Expansion-Joint Fittings for RNC:

1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 70 deg C (125 deg F) temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 86 deg C (155 deg F) temperature change.

2. Install fitting(s) that provide expansion and contraction for at least 0.06 mm per meter of length of straight run per deg C (0.00041 inch per foot of length of straight run per deg F) of temperature change.
3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 2 for pipe less than 150 mm (6 inches) in nominal diameter.
2. Install backfill as specified in Division 2.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 300 mm (12 inches) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 2.
4. Install manufactured duct elbows for stub-ups at poles and equipment.

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 12.5-mm (1/2-inch) sieve to 4.75-mm (No. 4) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: Set so cover surface will be flush with finished grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 16130

SECTION 16145 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following lighting control devices:

1. Time switches.
2. Outdoor photoelectric switches.
3. Multipole contactors.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

A. Line-Voltage Surge Protection: An integral part of the devices for 120-V solid-state equipment. For devices without integral line-voltage surge protection, field-mounting surge protection shall comply with IEEE C62.41 and with UL 1449.

2.3 TIME SWITCHES

A. Available Manufacturers:

1. Area Lighting Research, Inc.
2. Fisher Pierce.
3. Intermatic, Inc.
4. Leviton Mfg. Company Inc.
5. Lightolier Controls; a Genlyte Company.
6. Lithonia Lighting.
7. Paragon Electric Co.
8. Square D.
9. TORK.
10. Touchplate Technologies, Inc.
11. Watt Stopper (The).

B. Electromechanical-Dial Time Switches: Type complying with UL 917.

1. Contact Configuration: SPST.
2. Contact Rating: 20-A ballast load, 120/240-V ac.
3. Circuitry: Allow connection of a photoelectric relay as substitute for on and off function of a program.
4. Astronomical time dial.
5. Eight-Day Program: Uniquely programmable for each weekday and holidays.
6. Skip-a-day mode.
7. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 16 hours.

2.4 OUTDOOR PHOTOELECTRIC SWITCHES

A. Available Manufacturers:

1. Area Lighting Research, Inc.
2. Fisher Pierce.
3. Intermatic, Inc.
4. Lithonia Lighting.
5. Novitas, Inc.
6. Paragon Electric Co.
7. Square D.
8. TORK.
9. Touchplate Technologies, Inc.
10. Watt Stopper (The).

B. Description: Solid state, with SPST dry contacts rated for 1800 VA to operate connected load, relay, or contactor coils; and complying with UL 773.

1. Light-Level Monitoring Range: 16 to 108 lx (1.5 to 10 fc), with an adjustment for turn-on and turn-off levels within that range.
2. Time Delay: 15-second minimum, to prevent false operation.
3. Lightning Arrester: Air-gap type.
4. Mounting: Twist lock complying with IEEE C136.10, with base. Provide with stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the North sky exposure.

2.5 MULTIPOLE CONTACTORS

A. Available Manufacturers:

1. Allen-Bradley/Rockwell Automation.
2. ASCO Power Technologies, LP; a division of Emerson Electric Co.
3. Cutler-Hammer; Eaton Corporation.
4. Fisher Pierce.
5. GE Industrial Systems; Total Lighting Control.
6. Hubbell Lighting Inc.
7. Lithonia Lighting.
8. MicroLite Corporation.
9. TORK.
10. Touchplate Technologies, Inc.
11. Watt Stopper (The).

B. Description: Electrically operated and mechanically held, complying with NEMA ICS 2 and UL 508.

1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).
2. Control-Coil Voltage: Match control power source.

2.6 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG, complying with Division 16 Section "Conductors and Cables."

B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded copper conductors not smaller than No. 22 AWG, complying with Division 16 Section "Conductors and Cables."

PART 3 - EXECUTION

3.1 WIRING INSTALLATION

A. Wiring Method: Comply with Division 16 Section "Conductors and Cables." Minimum conduit size shall be 13 mm (1/2 inch).

B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

C. Install field-mounting transient voltage suppressors for lighting control devices in Category A locations that do not have integral line-voltage surge protection.

D. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.2 IDENTIFICATION

A. Identify components and power and control wiring according to Division 16 Section "Electrical Identification."

B. Label time switches and contactors with a unique designation.

3.3 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections:

1. After installing time switches, and after electrical circuitry has been energized, adjust and test for compliance with requirements.

B. Remove and replace lighting control devices where test results indicate that they do not comply with specified requirements.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION 16145

SECTION 16075 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Identification for raceway.
2. Identification for conductors.
3. Underground-line warning tape.
4. Warning labels and signs.
5. Equipment identification labels.

1.3 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering where devices are to be applied.

PART 2 - PRODUCTS

2.1 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Color for Printed Legend:

1. Power Circuits: Black letters on an orange field.
2. Legend: Indicate voltage.

C. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 50 mm (2 inches) wide; compounded for outdoor use.

2.2 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 0.08 mm (3 mils) thick by 25 to 50 mm (1 to 2 inches) wide.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.

1. Not less than 150 mm (6 inches) wide by 0.102 mm (4 mils) thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend shall indicate type of underground line.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 1-mm (0.0396-inch) galvanized-steel backing; and with colors, legend, and size required for application. 6.4-mm (1/4-inch) grommets in corners for mounting. Nominal size, 250 by 360 mm (10 by 14 inches).

2.5 EQUIPMENT IDENTIFICATION LABELS

A. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 25 mm (1 inch).

PART 3 - EXECUTION

3.1 APPLICATION

A. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits: Identify with orange self-adhesive vinyl tape applied in bands.

B. Power-Circuit Conductor Identification: For secondary conductors No. 1 AWG and larger use color-coding conductor tape. Identify phase.

C. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

D. Locations of Underground Lines: Identify with underground-line warning tape. Install underground-line warning tape for cables in raceway.

E. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to all equipment, unless it is provided with its own identification.

1. Labeling Instructions:

a. Stenciled legend 100 mm (4 inches) high.

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

D. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

E. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at 15-m (50-foot) maximum intervals in straight runs, and at 7.6-m (25-foot) maximum intervals in congested areas.

F. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for ungrounded service conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
2. Colors for 240/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.

3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 150 mm (6 inches) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 150 to 200 mm (6 to 8 inches) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 400 mm (16 inches) overall.

END OF SECTION 16075

SECTION 04413 - GRANITE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections. MDOT Standard Specifications, Supplemental Specifications, Standard Details, Supplemental Details, Rev. Dec. 2002. Should document discrepancies occur, the more restrictive shall prevail.

1.2 SUMMARY

A. This Section includes the following:

1. Granite bollards.

B. Related Sections include the following:

1. Division 1 Section "Quality Requirements."

1.3 SUBMITTALS

A. Samples for Verification: For each type indicated.

1. Include samples to verify color, texture, finish, shade and veining selected.

B. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.

C. Material Certificates: Signed by manufacturers.

D. Source quality-control test reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Manufacturer Qualifications: A qualified manufacturer.

C. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

D. Testing Agency: The Owner reserves the right to test granite materials supplied for the Project. Tests will be performed by a recognized testing laboratory.

E. Source Limitations: Obtain through one source from a single manufacturer.

F. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions,

arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Granite shall be carefully packed and banded by the supplier for shipment. Following shipping, granite shall be stored on wood skids or pallets, covered with non-staining, waterproof membrane and protected from the weather. Skids shall be placed and stacked in a manner as to evenly distribute the weight of the granite materials and prevent damage to granite pieces. Granite materials shall be stored in such a manner as to allow air to circulate around the material. Granite shall not be permitted to be in direct contact with the ground any time during storage.

B. Granite shall be carefully handled to prevent chipping, breaking, soiling or other damage. Pinch or wrecking bars shall not be used without protecting edges of granite with wood or other rigid materials. Granite units shall be lifted with wide-belt type slings wherever possible; wire ropes or ropes containing tar or other substances that might cause staining or damage to granite finish will not be permitted.

C. Granite damaged in any manner will be rejected, if it cannot be patched to the satisfaction of the Owner, and shall be replaced with new materials at no additional cost to the Owner.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit the work to be performed according to manufacturers' written instructions and warranty requirements.

PART 2 - PRODUCTS

2.1 SOURCE OF GRANITE

A. Source of Granite: Granite shall be supplied by the following:
Fletcher Granite Company, Inc.
275 Groton Road
North Chelmsford, MA 01863
Telephone: (978) 251-4031
Toll-Free: (800) 253-8168
Fax: (978) 251-1151

2.2 GRANITE

A. Granite Type: Select granite from Deer Isle, Stonington, Maine

B. Granite Properties: Granite as supplied shall meet or exceed the following:
1. Bulk Density (ASTM C 97): 2.63 pcf, average.
2. Absorption (ASTM C 97): 0.14% average.
3. Compressive Strength (ASTM C 170): 31,110 psi, average.
4. Modulus of Rupture (ASTM C99): 2,030 psi, average.

C. Finishes:
   1. Top – Split
   2. Bottom Sawn or Split
   3. Sides – Two sides split, two sides sawn.
   4. Sawn sides to have thermal finish.
   5. Drill holes and feather marks for splitting are desirable and should be left as part of the bollard.

D. Size and Dimension: Granite shall be of the sizes and dimensions indicated on the Drawings.

PART 3 - EXECUTION

3.1 ACCEPTABILITY OF BASE TO RECEIVE GRANITE

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING

A. All setting shall be done by competent granite setters under adequate supervision.

B. Before setting, granite shall be dry, clean and free of dirt and foreign matter on all sides.

C. Granite shall be set true to the required lines and grades. Direct bearing contact between granite pieces shall be prohibited.

3.3 CLEANING

A. Upon completion of granite work, surfaces shall be left in a clean, unsoiled condition, acceptable to the Architect and Owner.

3.4 PROTECTION

A. The Contractor shall be responsible for properly and adequately protecting the granite work until final acceptance of the Project by the Owner.

B. After the granite work has been installed, it shall be properly and adequately protected from damage. The Contractor shall provide boxing or other suitable protection wherever required. However, no lumber that may stain or deface the granite shall be used. Nails shall be high quality galvanized or non-rusting.

END OF SECTION 04413

SECTION 02760 - TEXTURED ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Requirements for the proper installation of textured asphalt pavement using StreetBond HW Surfacing System - high performance coating system for wet climatic zones, and duratherm and inlaid thermoplastic pavement systems.

B. Related sections:

1. Section 02230 Site Clearing
2. Section 02330 Subgrade and Roadbed Preparation
3. Section 02720 Unbound Base Courses
4. Section 02740 Flexible Pavement

1.2 REFERENCES

A. American Society for Testing and Materials

1. ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester.
2. ASTM D-4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
3. ASTM D-2697 Standard Test Method for Volume of Nonvolatile Matter in Clear or Pigmented Coatings

1.3 SUBMITTALS

A. Install StreetPrint Pavement Texturing and duratherm inlaid thermoplastic pavement systems using only certified Level I or Level II applicators. Submit documentary evidence of such certification to the Engineer prior to beginning work. Do not begin installation prior to receiving the Engineer's approval.

B. Test results showing that coating materials has the following properties:

1. Adhesion (PLI) To an Asphalt substrate (ASTM D-4541) Result: Cohesive failure of asphalt prior to adhesive failure.
2. Taber Abrasion H-10(Dry Wear Index) (ASTM D-4060). Maximum of 0.98 grams/1000 cycles after 7 days cure.
3. Solids by Volume (%) (ASTM D-2697). Minimum = 24 +/-2%.

1.4 DEFINITIONS

A. “Textured Asphalt Pavement” shall be described as "StreetPrint Pavement Texturing" or "StreetPrint" on the drawings and documents related to the project.

B. "Authorized StreetPrint Applicator" is a contractor licensed by Integrated Paving Concepts Inc., (Tel. 800-688-5652), and shall have a foreman, supervisor or lead hand on site who has successfully completed a StreetPrint Level 1 Accreditation Training Program.

C. "StreetPrint Duratherm Inlaid Thermoplastic" is a proprietary system developed by Integrated Paving Concepts, and is defined as a finishing system, which treats the surface of Hot Mix Asphalt Concrete (HMA) by imprinting existing asphalt pavement, with shallow (1/8" deep) depressions to replicate the design, as shown on the drawings or described in the specifications, and filling the imprinted depressions with heat applied prefabricated thermoplastic panels.

D. "Heat applied prefabricated thermoplastic panels" are defined as thermoplastic film cut to precise shapes required to fit the imprinted pattern in the asphalt surface, and colored as shown on the drawings. The panels shall be capable of being affixed to bituminous pavements, merely by application of heat.

E. "Imprinting Hot Mix Asphalt" is defined as pressing flexible templates into warm, fully-compacted, Hot Mix Asphalt to create the depressions in the asphalt surface as shown on the drawings.

F. "Templates" are defined as flexible, high density plastic, sheets pre-cut to the desired pattern, as shown on the drawings or in the specifications, designed for imprinting Hot Mix Asphalt.

G. "Accredited StreetPrint Duratherm Applicator" is someone who has successfully completed the StreetPrint Duratherm training program.

H. "Reheating of the asphalt surface" is defined as the softening of existing compacted Hot Mix Asphalt by applying heat to the asphalt surface using reciprocating infrared heaters. To avoid over heating or burning and degradation of the asphalt surface continuous monitoring of the surface temperature, during the heating process, using an infra red thermometer is recommended. Equipment that is specifically excluded from this section and shall not be used for reheating of the asphalt is any form of direct flame heaters or nor reciprocating heaters.

I. "StreetBond HW Surfacing System" is defined as multiple applications of premium coating material StreetBond SP150E.

1.5 DEFINITIONS

A. General: Since StreetPrint Duratherm Inlaid Thermoplastic is a finishing system, which treats the surface of Hot Mix Asphalt Concrete (HMA), the performance of StreetPrint Duratherm will be dependent upon the proper design and construction of the asphalt upon which it is installed.

B. Hot Mix Asphalt Concrete Supply and install Hot Mix Asphalt Concrete as required by the jurisdiction having authority or the Owner's Materials or Pavements Engineer.

C. Imprinting of Hot Mix Asphalt Concrete: Layout and imprint the pattern into the surface of the HMA shall be as per the drawings or specifications. Imprinting shall be carried out after the paving is completed. The asphalt surface shall be re-heated to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template. The application of heat to existing asphalt surface shall be done using reciprocating infra red re-heating equipment. Direct flame heaters and non-reciprocating heaters shall not be allowed to be used for this purpose. The temperature of the asphalt surface shall be regularly monitored during the reheating process, to avoid over heating and degradation of the asphalt cement. Once the asphalt has reached imprinting temperature, the templates shall be placed in position and pressed into the surface using vibratory plate compactors.

D. Application of Pre-formed Thermoplastic Panels: Supply and install “Pre-formed Thermoplastic Panels” as per the specifications.

The surface shall be clean and free of all dust, silt, debris and, most importantly, chemical residue from de-icing materials. If de-icing material has been used on the road in the past, cleaning shall be carried out using pressure washing.

The panels shall be placed in position on completely dry asphalt, in the imprinted area. Heat shall be gently applied to the surface using reciprocating infra red heaters, slowly raising the surface temperature until the thermoplastic material in the panels start to liquefy and flow, but no higher than 325º F. Once the thermoplastic material has liquefied, the heat source shall be removed and the surface allowed to cool to ambient temperature. Only once the asphalt surface and the thermoplastic has reached ambient temperature may the road be opened to traffic.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Preformed Thermoplastic Panels: The Owner or Owner's representative shall specify the colors and patterns of the “Pre-formed Thermoplastic Panels” that will be installed. The pre-formed pre-cut markings shall be supplied by Integrated Paving Concepts, Inc. The thermoplastic material shall have a thickness of 90 mils, and consist of color pigmented plastic film with imbedded reflective glass spheres, uniformly distributed throughout their entire cross-sectional area.

2.2 EQUIPMENT

A. “Templates” are defined as flexible, woven wire rope cut and welded into various patterns, as per the design shown on the drawings, and used for imprinting Hot Mix Asphalt.

B. “Reciprocating Infra-Red Heater” is defined as equipment specifically designed to apply heat to the asphalt surface to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template. The heating equipment used shall allow continuous monitoring of the surface temperature to ensure the asphalt does not over heat and burn. Equipment that is specifically excluded from this section and shall not be used for reheating of the asphalt is any form of direct flame heaters.

PART 3 - EXECUTION

3.1 PREPARATION

A. Hot Mix Asphalt Concrete Paving (HMA) shall conform to the requirements of the (HMA Spec) including gradation and compaction requirements. Asphalt thickness and width shall be as per the drawings. The placement of the asphalt shall be carried out with regard for the imprinting process to avoid visible seams. The HMA shall be fully compacted prior to imprinting of the templates.

B. Heating and Imprinting of Asphalt and Application of Coating The Contractor shall follow the latest StreetPrint Application Procedures as issued by Integrated Paving Concepts Inc.

C. Surface Preparation Prior to Coating The asphalt surface shall be free of dirt, debris, oil or anything that will adversely affect the adhesion of the new coating system. All loose material on the asphalt surface shall be removed by mechanical brooming, or blowing clean using a backpack blower or compressed air.

Any difficult to remove dirt shall be removed using a Pressure Washer. Prior to applying the coatings, the asphalt surface shall be completely dry.

3.2 CONSTRUCTION

A. Layout and Imprinting Layout and imprinting of the pattern into the surface of the HMA shall be as per the drawings.

B. Heating of Asphalt The upper portion of the asphalt surface shall be heated using reciprocating infra red re-heating equipment to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template. Overheating of the asphalt shall not be permitted. Direct flame heaters shall not be allowed for the purpose of heating the asphalt. Hot air portable heaters may only be used for heating isolated areas. The temperature of the asphalt surface shall be regularly monitored during the reheating process. The asphalt pavement shall be adequately heat soaked (softened) to a depth of at least ½ inch, without burning the asphalt. The asphalt surface temperature shall not exceed 300oF. If during the re-heating process the surface is overheated and begins to emit black smoke, the contractor shall stop work immediately. The damaged surface area shall be removed by milling the upper 1” and replaced by a partial depth patch with the topmost layer matching the existing surface layer mix and binder. Patching and all work associated with the repair effort shall be at no cost to the Owner.

C. Surface Imprinting Templates shall be pressed fully into the heated asphalt surface using vibratory plate compactors.

D. Installation and Bonding of Pre-formed Thermoplastic Panels: The thermoplastic shall be applied only in dry conditions. The thermoplastic shall be placed on the clean, dry, asphalt, in the imprinted pattern, prior to application of heat. Once the thermoplastic is in place, heat shall be applied using a reciprocal infrared heater. The asphalt surface temperature shall not exceed 325 o F (163 °C). If smoke is visible, that is an indication that the asphalt and/or the thermoplastic material is burning. Apply sufficient heat to liquefy the thermoplastic. This is achieved when the joints in the thermoplastic panels flow together. Bonding of the thermoplastic material to the asphalt surface can be monitored by carefully lifting a corner of the thermoplastic material before it completely cools. If asphalt is attached to the base of the thermoplastic material sufficient heat was applied. If not re-apply heat.

3.3 QUALITY CONTROL

A. StreetPrint All StreetPrint projects shall have on site a foreman, supervisor or lead hand who is registered with Integrated Paving Concepts, Inc., as a Level 1 Accredited StreetPrint Installer.

B. Protection From Traffic No traffic shall be allowed onto the coated surface until the coating has completely dried and has cured as set out in the manufacturer's instructions.

C. Utility Cuts All utility, traffic loop detector, and other items requiring a cut and installation under the asphalt surface shall be completed prior to installation of stamped patterned asphalt treatment.

D. Stamping Depth Upon completion, the patterned area shall be checked for proper depth of print, by taking random samples. 98% of the stamped area shall have an imprint depth of 3/8 inch. If any sample areas have an imprint depth that is less than 3/8 inch, those areas shall be re-heated and re-stamped prior to applying the coatings.

3.4 MEASUREMENT

A. Textured Asphalt The quantity to be paid will be the area in square meter of stamped asphalt pavement, measured in place, completed and accepted. No deduction will be made for the area(s) occupied by manholes, inlets, drainage structures, or by any public utility appurtenances within the area.

3.5 PAYMENT

A. Price and payment will be full compensation for all work specified in the Section, the quantity, determined as provided above, will be paid for at the contract unit price per square meter.

END OF SECTION 02760

SECTION 02870 - SITE FURNISHINGS

1.1 SUMMARY

A. Tree Grates.

1.2 MATERIALS

A. Steel and Iron:

1. Retrofit R-9003 by Neenah or equal.

2. Gray iron castings: ASTM A-48, Class 35 or better.

B. Finishes:

1. Cast Iron: All castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. They shall be of uniform quality; free from blowholes, porosity, hard spots, shrinkage distortion or other defects. They shall be well cleaned by blasting. Grates shall not be painted.

C. Installation Method: Retrofit; per manufacturer direction. Submit shop drawing to architect for approval prior to manufacture or installation.

END OF SECTION 02870

INTRODUCTION

Architects and Landscape Designers have found that NEENAH'S cast iron tree grates and fabricated steel tree guards continue to be the strongest, most cost-effective solution for protecting and complementing trees in urban environments.

With quality tree grate castings produced entirely in the U S A, you can specify NEENAH with confidence, and choose from the largest selection of tree grates in the industry.

TREE GRATE REFERENCE GUIDE

SIZE	CAT #	COLLECTION	PAGE
SQUARE			
30"	R-8700	Other	13
30"	R-8704	Avenue	6
36"	R-8702-A	Other	13
36"	R-8704-A	Avenue	6
48"	R-8706-1A	Metropolitan	4-5
48"	R-8706-A	Metropolitan	4-5
48"	R-8708	Boulevard	7
48"	R-8710	Avenue	6
48"	R-8721-A	Parkway	10-11
48"	R-8724-A	Other	13
48"	R-8726	Parkway	10-11
48"	R-8730	Other	13
48"	R-8742	Adirondack	8
48"	R-8750	Parkway	10-11
48"	R-8752-2	Adirondack	8
48"	R-8757	Greenwich	7
48"	R-8759	Other	13
48"	R-8768	Other	13
48"	R-8770	Other	13
60"	R-8707	Metropolitan	4-5
60"	R-8712	Avenue	6
60"	R-8713	Boulevard	7
60"	R-8714-A	Metropolitan	4-5
60"	R-8717	Majestic	9
60"	R-8728-A	Parkway	10-11
60"	R-8734	Parkway	10-11
60"	R-8737-C	Other	13
60"	R-8738-A1	Parkway	10-11
60"	R-8742-A	Adirondack	8
60"	R-8742-A1	Adirondack	8
60"	R-8746-A	Adirondack	8
60"	R-8752-A	Adirondack	8
60"	R-8752-B	Parkway	10-11
60"	R-8754	Greenwich	7
60"	R-8754-1	Greenwich	7
60"	R-8760	Other	13
60"	R-8762	Other	13
64"	R-8766	Parkway	10-11
72"	R-8709-A	Metropolitan	4-5
72"	R-8715	Avenue	6
72"	R-8716	Boulevard	7
72"	R-8718	Majestic	9
72"	R-8718-A	Majestic	9
72"	R-8737-B	Other	13
72"	R-8738-1	Parkway	10-11
72"	R-8738-2	Parkway	10-11
72"	R-8740-1	Parkway	10-11
ROUND			
30"	R-8825	Other	13
36"	R-8834	Metropolitan	4-5
42"	R-8829	Adirondack	8
48"	R-8830-1	Metropolitan	4-5
48"	R-8830-A1	Metropolitan	4-5
48"	R-8832	Boulevard	7
48"	R-8832-A	Boulevard	7
48"	R-8874	Greenwich	7
50"	R-8833	Adirondack	8
50"	R-8847	Parkway	10-11
54"	R-8855-2	Parkway	10-11
56"	R-8843	Capitol	9
56"	R-8849	Parkway	10-11
60"	R-8837-1	Adirondack	8
60"	R-8837-A	Adirondack	8
60"	R-8838	Boulevard	7
60"	R-8838-1	Boulevard	7
60"	R-8838-A	Boulevard	7
60"	R-8838-A1	Boulevard	7
60"	R-8869-A	Metropolitan	4-5
60"	R-8870	Metropolitan	4-5
60"	R-8871	Majestic	9
60"	R-8871-1	Majestic	9
66"	R-8851	Parkway	10-11
72"	R-8855-1	Parkway	10-11
72"	R-8857	Capitol	9
72"	R-8876	Avenue	6
72"	R-8876-1	Avenue	6
72"	R-8880-A	Metropolitan	4-5
75"	R-8839	Capitol	9
93"	R-8860	Adirondack	8
31-3/4"	R-8827	Adirondack	8
39-3/4"	R-8827-A1	Adirondack	8
55-1/4"	R-8872	Avenue	6
58-1/2"	R-8843-A	Capitol	9
RETROFIT			
40"	R-9003	Retrofit	12
52"	R-9002	Retrofit	12
54"	R-9101-A	Retrofit	12
62"	R-9004-1	Retrofit	12
64"	R-9002-A	Retrofit	12
36"X72"	R-9105	Retrofit	12
54"X59"	R-9101	Retrofit	12
40"X52"	R-9106	Retrofit	12
52"X100"	R-9107	Retrofit	12
RECTANGULAR			
36"X48"	R-8814	Boulevard	7
36"X48"	R-8814-A	Boulevard	7
36"X60"	R-8810	Avenue	6
36"X72"	R-8808	Parkway	10-11
36"X72"	R-8809	Metropolitan	4-5
48"X72"	R-8802-A	Parkway	10-11
48"X72"	R-8811	Boulevard	7
48"X72"	R-8819	Greenwich	7
60"X84"	R-8811-A	Boulevard	7
OVERSIZE			
48"X108"	R-8813	Oversize	12
48"X120"	R-8806-1A	Oversize	12
48"X144"	R-8815	Oversize	12
60"X95-3/4"	R-8816	Oversize	12
48"X108"	R-8817	Oversize	12
MULTI-SIDED			
44-1/2"	R-8950	Adirondack	8
60"	R-8955	Adirondack	8
60"	R-8965	Metropolitan	4-5
64"	R-8952	Parkway	10-11
64"	R-8953	Other	13
COMBINATION			
56"	R-8927	Capitol	9
60"	R-8933-A	Metropolitan	4-5
62"	R-8929	Parkway	10-11
64"	R-8937	Parkway	10-11
72"	R-8931-1	Parkway	10-11
72"	R-8939	Avenue	6

	PAGE
OTHER	
Custom Logos	14
Medallions	14
Tree Guards	15

SPECIFICATIONS

1. **General:**
   Tree grates and frames shall be of cast iron as manufactured by Neenah Foundry Company.
2. **Material:**
   Gray Iron castings shall conform to A.S.T.M. A-48, Class 35 or better.
3. **Finish:**
   All castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. They shall be of uniform quality; free from blowholes, porosity, hard spots, shrinkage distortion or other defects. They shall be well cleaned by blasting.
4. **Paint:**
   Tree grates and frames shall be furnished without paint or primer as the standard. See page 2 for details on available paint finishes.
5. **Submittals:**
   Manufacturer's shop drawings shall be submitted to the architect/engineer for approval prior to manufacture. The architect/engineer shall retain the right to reject castings not conforming to this specification and/or approved submittal drawings.

Note: Architect/Engineer must specify tree grate number and frame if required. Paint requirements and security bolting requirements must also be specified.

When selecting the tree grate and planning its location, the safety of cyclists, pedestrians, and persons with disabilities must by considered.

Contact your local Neenah Foundry representative or our Inside Sales Service staff for complete detail and submittal drawings of our entire tree grate line.

ALL NEENAH TREE GRATES ARE MANUFACTURED FROM RECYCLED MATERIALS INCLUDING AUTOMOBILE BODIES AND OTHER COLLECTED SCRAP IRONS.

EXPANDABLE

NEENAH cast iron tree grates provide the advantage of being easily expandable without losing their structural integrity. As trees grow through the years, the tree opening can be enlarged in increments to accommodate the larger trunk. The best method to expand the opening is through the use of an abrasive cutting wheel, notching the radial spokes at the junction of the expansion rings, then breaking away the portion to be discarded. An alternative method includes using a power hacksaw – in some cases even a sharp cold chisel will work.

WHY CAST IRON?

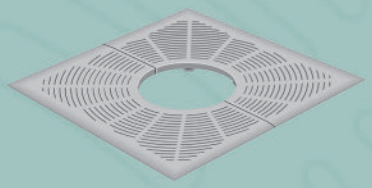
Unlike steel, cast iron is inherently resistant to continued corrosion. When left unpainted, cast iron tree grates and frames will remain unchanged for decades.

Cast iron tree grates from NEENAH are strong and will stand up to urban abuse. (Note: not recommended for vehicular traffic.)

Cast iron tree grates are heavy enough to deter unauthorized removal without the need for lock down devices.

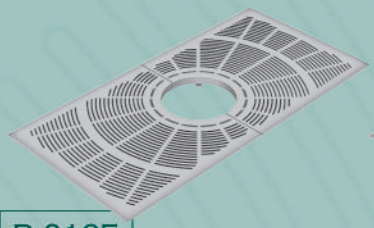
RETROFIT COLLECTION

Developed specifically for use in an existing paved area, the RETROFIT collection is a popular alternative to poured-in-place grates. Level concrete can simply be cut to the necessary opening size. The overlapping edge covers any minor irregularities in the cut.



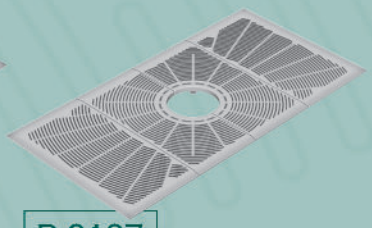
R-9003

40" square for 36" square opening, 16" diameter expandable tree opening. 1/4" slot openings.
175 pounds per set.



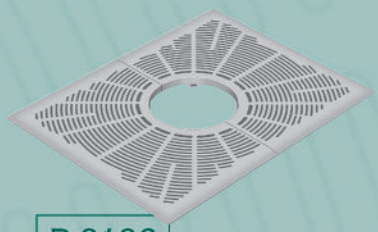
R-9105

36"x72" rectangular for 32"x68" rectangular opening, 16" diameter expandable tree opening. 1/4" slot openings.
340 pounds per set.



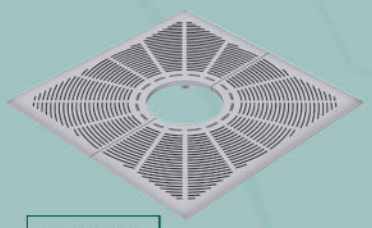
R-9107

Four piece grate, 52"x100" rectangular for 48"x96" rectangular opening, 16" diameter expandable tree opening. 3/8" slot openings.
654 pounds per set.



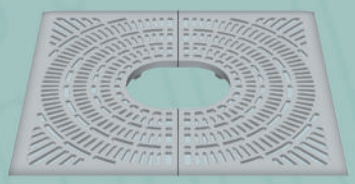
R-9106

40"x52" rectangular for 36"x48" rectangular opening, 16" diameter expandable tree opening. 1/4" slot openings.
308 pounds per set.



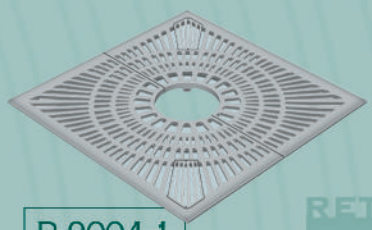
R-9002

52" square for 48" square opening, 16" diameter expandable tree opening. 1/4" slot openings.
(Available for 60" opening, order as R-9002-A.)
310 pounds per set.



R-9101

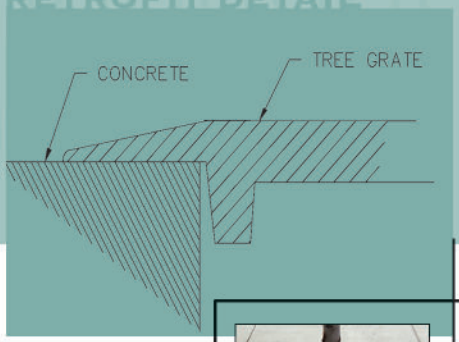
59"x54" for 55"x50" rectangular opening, 16" diameter oval expandable tree opening.
(Available as 54" square grate with round tree opening, order as R-9101-A.)
410 pounds per set.



R-9004-1

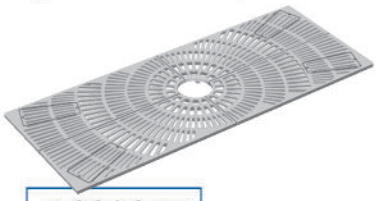
62" square for 57-1/2" square opening, 16" diameter expandable tree opening. Bolted light opening grates (7-3/4"x 15-3/8"x5-3/4") for use with sub-grade lighting.
440 pounds per set.

RETROFIT DETAIL



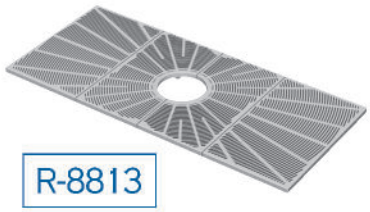
EXTENDED COLLECTION

Where space and design consideration permit, the EXTENDED collection provides the opportunity to promote tree health through the use of larger tree pits. Many of our other collections can have extension grates created as well...contact your NEENAH representative with your needs.



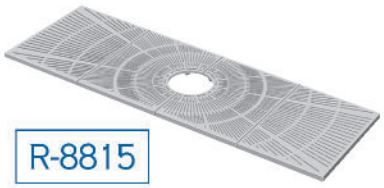
R-8806-1A

Four piece grate, 48"x120" rectangular with 12" diameter expandable tree opening. Bolted light opening grates (9"x19"x6") for use with sub-grade lighting. *(Support at section joint is required—furnished by installer.)*
720 pounds per set.



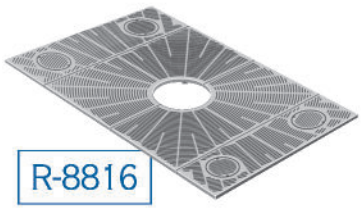
R-8813

Four piece grate, 48"x108" rectangular with 16" diameter expandable tree opening. Total grate length can be increased with additional end sections. 1/4" slot openings.
625 pounds per set.



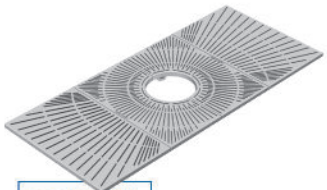
R-8815

Four piece grate, 48"x144" rectangular with 18" diameter tree opening. 1/4" slot openings.
1180 pounds per set.



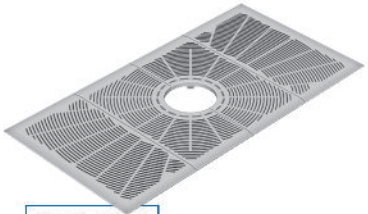
R-8816

Four piece grate, 60"x95-3/4" rectangular with 18" diameter expandable tree opening. 1/4" slot openings.
760 pounds per set.



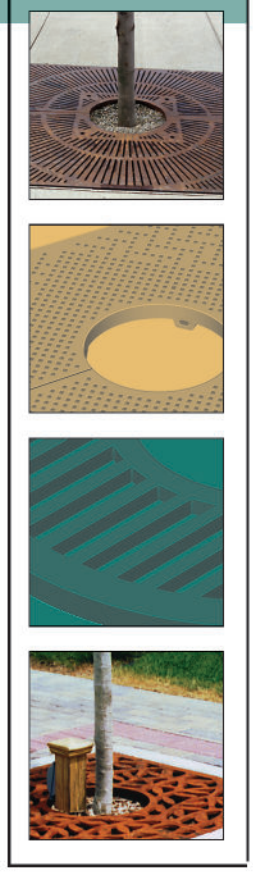
R-8817

Four piece grate, 48"x108" rectangular with 18" diameter expandable tree opening. 1/4" slot openings.
685 pounds per set.



R-9107

Four piece grate, 52"x100" rectangular for 48"x96" rectangular opening, 16" diameter expandable tree opening. 3/8" slot openings.
654 pounds per set.



Planting Species and Quatities List

High Streets Improvements Project
WBRC Project Number 3036.20

Site Planting Species Specification and Quantities List
Sheet LP101-G1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.147	AML	Amelanchier laevis (single stem)	2.5-3" Cal. B&B	Each	5
621.279	FPP	Fraxinus pennsylvanica 'Patmore'	2.5-3" Cal. B&B	Each	8
621.279	GTI	Gleditsia triacanthos var. inermis 'Shademaster'	2.5-3" Cal. B&B	Each	5
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	339
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	25
621.402	JHB	Juniperus horizontalis 'Bar Harbor'	2-3' B&B	Each	17
621.28	MRB	Malus 'Red Barron'	2-2.5" Cal. B&B	Each	8
621.28	MSS	Malus 'Spring Snow'	2.5-3" Cal. B&B	Each	1
621.54	RRA	Rosa rugosa 'Alba'	18-24" Cont.	Each	8
621.54	RSW	Rosa 'Seafoam White'	18-24" Cont.	Each	2
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	11

Site Planting Species Specification and Quantities List
Sheet LP101-A1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	165
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	9
621.28	MSS	Malus 'Spring Snow'	2.5-3" Cal. B&B	Each	8
621.54	RRA	Rosa rugosa 'Alba'	18-24" Cont.	Each	1
621.54	RSW	Rosa 'Seafoam White'	18-24" Cont.	Each	5
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	2

Site Planting Species Specification and Quantities List
Sheet LP102-G1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.279	FPP	Fraxinus pennsylvanica 'Patmore'	2.5-3" Cal. B&B	Each	7
621.279	GTI	Gleditsia triacanthos var. inermis 'Shademaster'	2.5-3" Cal. B&B	Each	5
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	50
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	23
621.54	RSW	Rosa 'Seafoam White'	18-24" Cont.	Each	3
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	9
621.28	SRI	Syringa reticulata 'Ivory Silk'	2.5-3" Cal. B&B	Each	6

Site Planting Species Specification and Quantities List
Sheet LP102-A1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.281	GBI	Ginko biloba 'PNI 2720' (Princeton Sentry)	2.5-3" Cal. B&B	Each	6
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	90
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	11
621.28	MSS	Malus 'Spring Snow'	2.5-3" Cal. B&B	Each	2
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	9
621.28	SRI	Syringa reticulata 'Ivory Silk'	2.5-3" Cal. B&B	Each	2

Site Planting Species Specification and Quantities List
Sheet LP103-G1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.281	GBI	Ginko biloba 'PNI 2720' (Princeton Sentry)	2.5-3" Cal. B&B	Each	9
621.28	MSS	Malus 'Spring Snow'	2.5-3" Cal. B&B	Each	4
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	109
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	6
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	14

Site Planting Species Specification and Quantities List
Sheet LP103-A1

Item Number	Item Code	Scientific Name	Planting Condition	Unit	Qty
621.281	GBI	Ginko biloba 'PNI 2720' (Princeton Sentry)	2.5-3" Cal. B&B	Each	2
621.279	FPP	Fraxinus pennsylvanica 'Patmore'	2.5-3" Cal. B&B	Each	3
621.28	MSS	Malus 'Spring Snow'	2.5-3" Cal. B&B	Each	4
621.71	HHA	Hemerocallis 'Happy Returns'	2 Qt	Each	230
621.402	JCP	Junipeus chinensis 'Pfitzeriana Compacta'	2-3' B&B	Each	4
621.54	RTF	Rosa 'The Fairy'	18-24" Cont.	Each	5